FOOD MANUFACTURE

Incorporating Food Industries Weekly

A PUBLICATION OF THE LEONARD HILL TECHNICAL GROUP FEBRUARY 1, 1958

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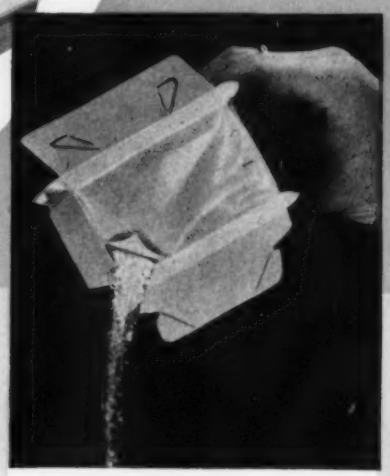

The Expresso carton is easy to open fully, but if you want to pour out a portion and leave the rest in the carton you have only to slit the diaphragm at one corner. The pack can then be reclosed giving considerable protection to the product, and remaining spill proof.

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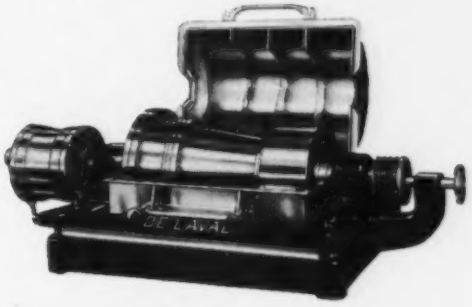

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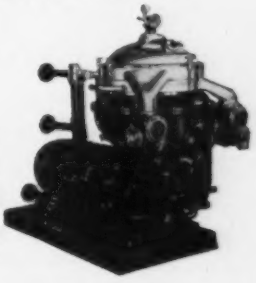

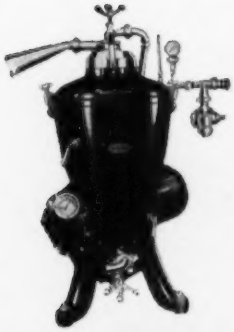

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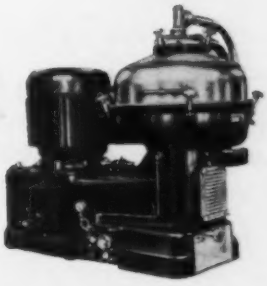

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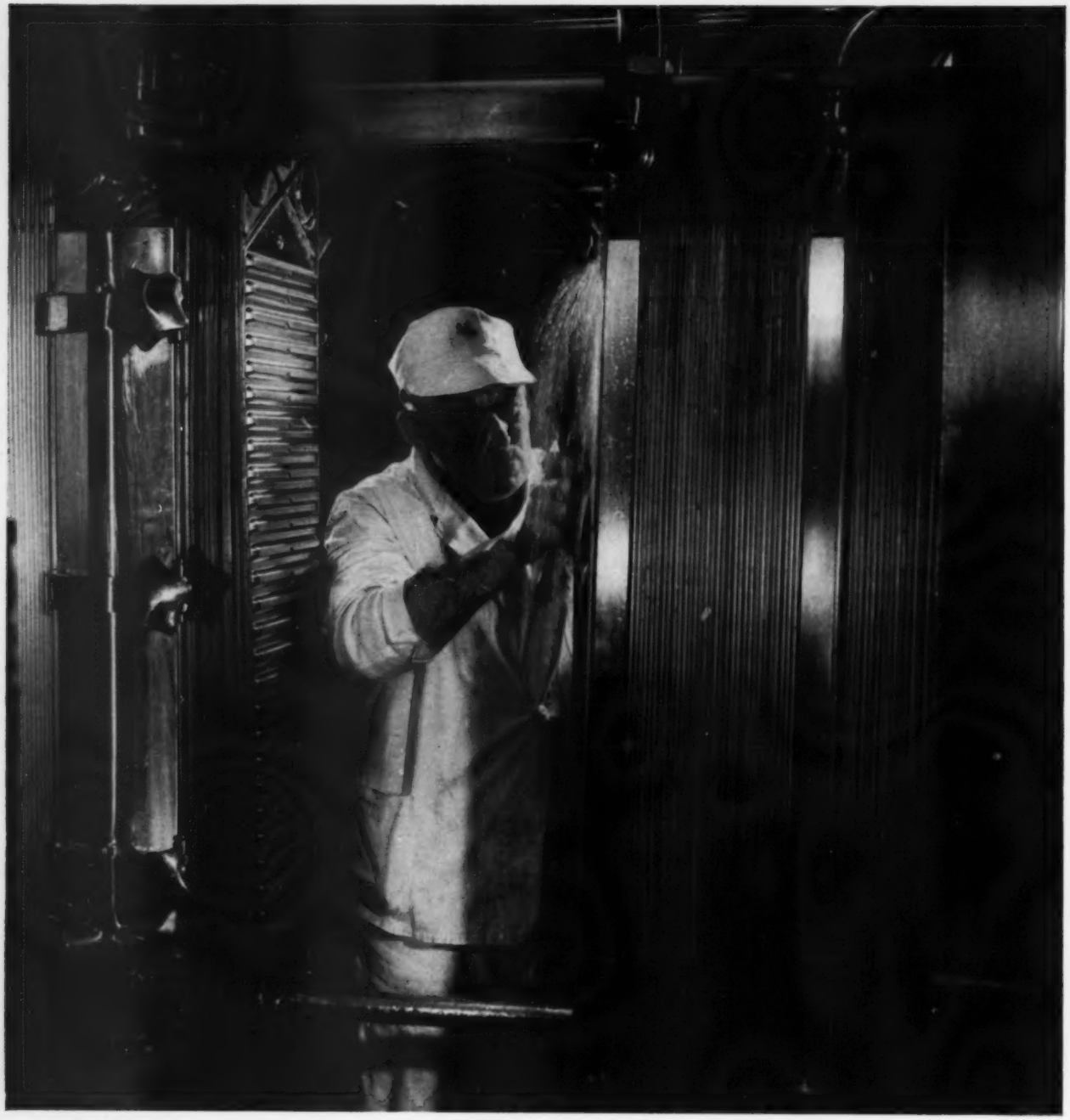

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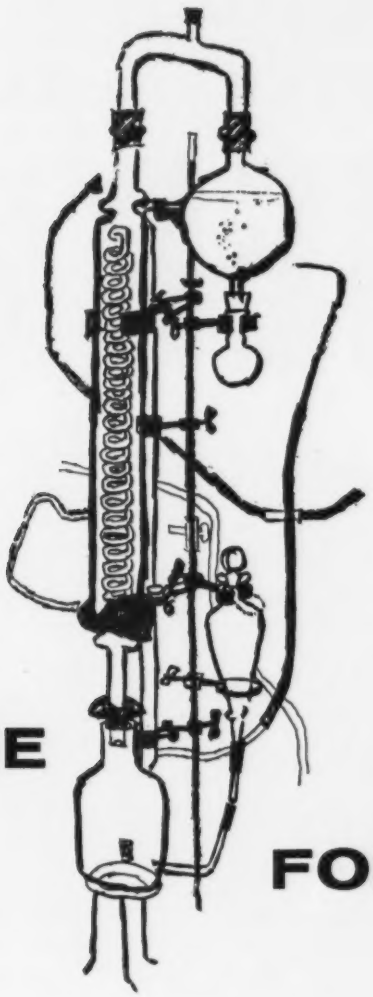

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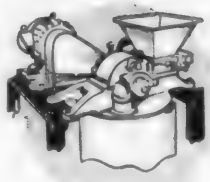
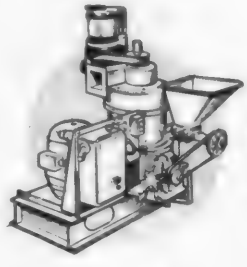
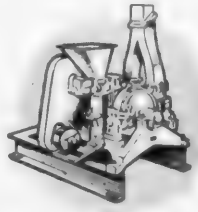
Mikro-D equipment has been built for many years in Bristol by George Adlam & Sons Ltd., in association with Pulverizing Machinery Division Metals Disintegrating Co. Inc,, of U.S.A. This is now marketed solely by Pulverizing Machinery Ltd., a new company representing these parent organisations, who are able to offer Mikro-D users an efficient spares service, and the facilities of extensive research laboratories at Bristol.



The Mikro-Pulverizer
A high speed mechanical pulverizer offering a wide range of particle sizing, (10-300 mesh) safe and economical for both wet and dry grinding. Available in six sizes with capacities from 10-10,000 lbs. per hour.



The Mikro-Bud
A new vertical hammer mill with built-in air classifier for the reduction of solids to within the 80-10 micron range. Particle sizing can be changed in seconds while the machine is in operation.
10°F maximum temperature rise.
Available in two sizes giving 35/70 lbs. per hp/hour.



The Mikro-Atomizer
A mechanical, screenless mill for the production of smooth, ultra-fine powders in the lower micron range (25-1 microns). Compact and highly efficient. Available in three sizes with capacities from 5-5,000 lbs. per hour.

PULVERIZING MACHINERY LIMITED

If you use Mikro-D equipment, or if you have grinding or powder conveying problems, full details of these new services will be supplied on request to

Technical Sales Office, 1 Dover Street, Piccadilly, London, W.1.

Telephone: Hyde Park 9528-9

PRESERVATIVE PROBLEM ?
COLOUR IMPROVEMENT ?

Think about

Liquid Sulphur Dioxide
Sodium Hydrosulphite
Ammonia
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HYGIENIC SIZE REDUCTION FOR ALL FOOD PRODUCTS

The Scott-Rietz Angle Disintegrator is designed to give uniform fine grinding with instantaneous homogenizing and is particularly suitable for baby foods, potted meats, fish pastes, vegetable purées, tomato and fruit juices. Built to the highest standards of hygiene, all contact parts are of stainless steel and can be rapidly dismantled for cleaning.

The machine operates at high speed and is fitted with a full 360° screen giving uniform fine grinding and constant particle size. The exclusive Scott-Rietz Differential Discharge can be fitted to separate waste materials from the primary product. Special belt drive provides for change in speed and oil-mist lubrication can be provided if required. Scott-Rietz Disintegrators can be supplied in three sizes with rotor diameters of 6 in, 8 in, and 12 in.

Please write for Bulletin No. 119 which gives details of Scott-Rietz Food Processing Equipment.

GEORGE SCOTT & SON (London) LTD.

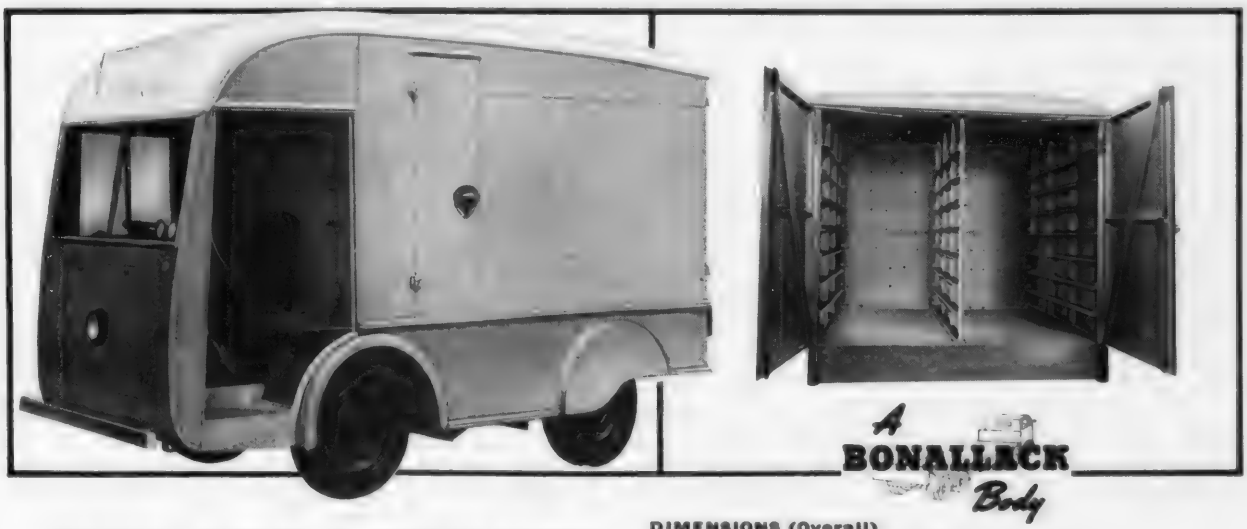
HEAD OFFICE: *Leven, Fife, Scotland.*
Phone: Leven 344. Grams: Niobate, Leven, Fife.

LONDON OFFICE: *Artillery House, Artillery Row, S.W.1. Phone: ABBey 2121 Grams: Niobate, Sowest, London.*

ONE OF THE BALFOUR GROUP OF COMPANIES SR7

BONALLACK deliver the goods -MORE Goods

Here is a Bonallack Body specially designed for the Bakery Trade



The less the deadweight, the greater the pay-load—that is the fundamental of all BONALLACK body construction. This body (mounted on a 10 cwt. Morrison Electric) provides the greatest possible pay-load for the total capacity of the vehicle.

There is nothing deceptive about the clean, streamlined appearance of this Baker's van, either: it looks, and it is, just the job for the job.

Your roundsman will be happy with 48 trays in the main body, carrying 720 loaves. In the front compartment he can take either another 192, or use it for pastries and cakes; and tray operation is as simple as pie.

It is 100% hygienic, very light, exceptionally strong, and will give years and years of service.

DIMENSIONS (Overall)
Length 11' 9½", width 5' 7", height from ground 8' 1".

DESIGN
An all-metal, rustless, hygienic body, constructed in two compartments; the front racked transversely with side doors, the rear racked longitudinally with double rear doors. Separate driver's compartment, full width seat, and full depth partition. Stressed-skin doors with sliding windows in polished frames can be provided as an optional extra.

CONSTRUCTION
Built in fully heat-treated aluminium alloy sheet and extruded sections, with argon-welded frames and riveted racking. Roofed in translucent fibre glass (tinted at option) with shaped front fascia board and integrally bonded alloy frames and ventilators.

VARIATION
Quotations are available for this type of body adapted to other chassis.

BODY-WEIGHT
6½ cwts.

PRICE
Mounted complete on Chassis, ex works, Basildon, Essex— £331.10.0 nett. With doors and decorative side-panel beading—£367.10.0 nett.

Established 1825

BONALLACK & SONS LTD

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40-42 Cannon Street, London, E.C.4
City 4304/8

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Basildon 20481/91

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268/270 Romford Road, Forest Gate, London, E.7
Maryland 7161/4

BODY REPAIR WORKS
1041 Romford Road, Manor Park, London, E.12
Ilford 5333/8

Bostik posed a problem

FLEXILE simply solved it

The makers of 'Bostik', the well-known sealing compound, had a problem —to find a contemporary tube for their new-style adhesive 'Clear Adhesive' without materially increasing costs. Like so many manufacturers, they called in Flexile. The new Flexile Polythene Flowerpot Cap gave the complete answer. Here's why. 1. As the caps were made from standard tools, no extra tool charges were incurred. 2. Being polythene and wadless, the caps could be supplied at low cost. 3. The special ring seal gave perfect closure and eliminated seepage, yet the cap, being polythene, did not become cemented to the nozzle. 4. The distinctive appeal of the cap gave an entirely new look to a 'Bostik' tube. Yes, Flexile have a flair for solving tube packaging problems . . . they can help you solve yours. *Phone Flexile first.*

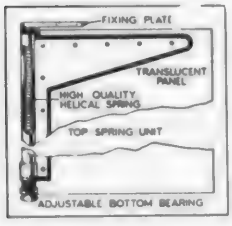
FLEXILE OF STEVENAGE

JUST PUBLISHED. A new brochure "If the cap fits . . ." describes all the advantages of Flexile Polythene Caps. Send for a free copy TODAY

FLEXILE METAL CO. LTD., BESSEMER DRIVE, STEVENAGE, HERTS · STEVENAGE 1491

What is a door?

The dictionary defines a door as "a barrier at the entrance to a room or building". Every building has a door, and each door has its problems. In factories, hospitals, warehouses and offices, in fact wherever there are doorways constantly used by traffic, there is need for a door that will eliminate accidents and withstand damage. Neway Translucent Doors do just this. The doors are fitted with plastic panels which allow objects on the other side to be seen in shaded form whilst still retaining privacy. The panels are flexible and yet close tight enough to seal out draughts and noise. Smart, easily cleaned, and self-closing, they absorb shock and blows from passing traffic without damage either to the traffic or to themselves. Neway Translucent Doors are available in sizes up to 8′ × 6′ per pair, and can be installed in existing frames. Once fitted little or no maintenance is ever needed.



The framework of the door consists of a vertical tube which fits close to the door frame. Concealed in the top of the tube is the patented double action return spring—this is fully adjustable and ensures that the door is self closing. The door pivots at the top and bottom on axles let into the lintel and into the floor.

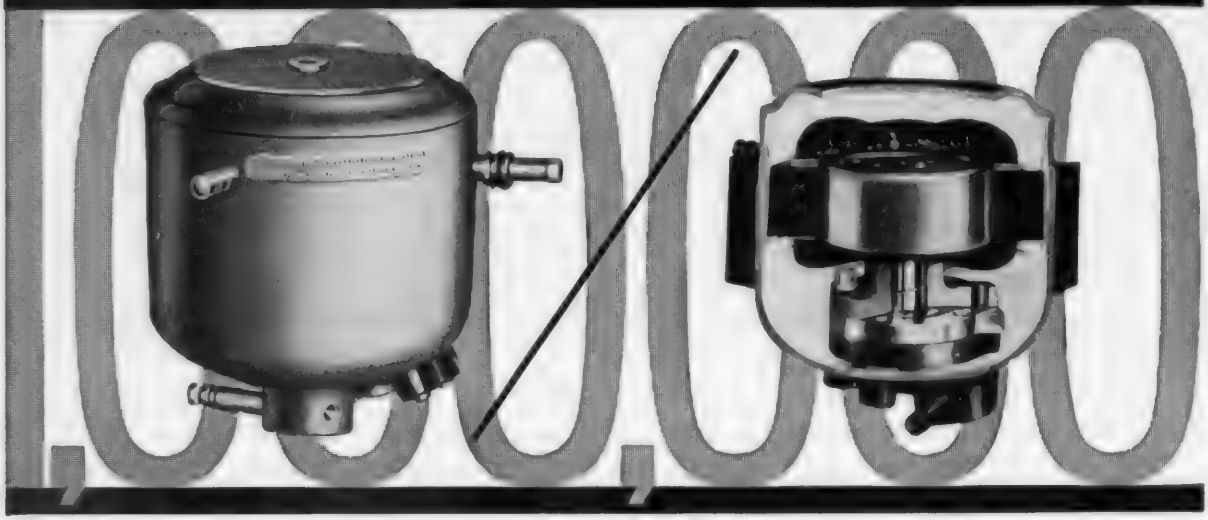
NEWAY

Translucent Doors

✱ *Write now for free leaflet giving full information about Neway Translucent and Rubber Doors*

WILLIAM NEWMAN & SONS LTD. (Dept. TC1) HOSPITAL STREET, BIRMINGHAM 19

FRIGIDAIRE produces the MILLIONTH British Made 'METER-MISER'!



THE SIMPLEST REFRIGERATION MECHANISM EVER MADE!

On November 29th 1957, the Millionth " Meter-Miser " came off the production line at the Frigidaire factory in England. Now over one million British made " Meter-Miser " compressors are in service. Why has this exclusive Frigidaire rotary compressor achieved such success? Compare its unique construction and performance with those of any other refrigerator's power unit – and you have the answer!

SIMPLE CONSTRUCTION

The " Meter-Miser " is the simplest refrigeration mechanism ever made – it has only *three moving parts!*

TROUBLE FREE

These parts are *machined* to a ten thousandth part of an inch; *surface finished* to three Micro inches; assembled in a strictly controlled air conditioned room, and critically checked by electrical gauges that can detect measurements as thin as the wall of a soap bubble.

HARD WORKING YET LONG LASTING

These moving parts are continuously separated by a film of oil to protect them from the wear of power-consuming friction (no measurable wear has been detected in " Meter-Misers " inspected after periods equivalent to thirty years service). Lubricated for life, and hermetically sealed in a steel case, the " Meter-Miser " mechanism is completely protected against damage from dirt, dust and moisture. And remember – like all Frigidaire compressors, the " Meter-Miser " carries a five year warranty.

POWERFUL BUT ECONOMICAL

While the motor is running – it is automatically rested when the correct refrigeration temperature is reached – the " Meter-Miser's " powerful one-way rotating action causes suction and compression of the refrigerant simultaneously; this unit uses the absolute minimum of electricity.

ONLY FRIGIDAIRE HAS THIS AMAZING POWER UNIT!

Exclusive to Frigidaire, the " Meter-Miser " powers a wide range of refrigeration equipment.

FREE BROCHURE ON THE "METER-MISER" – write for this and details on how it can help you in your business.

Another Milestone in the Frigidaire Five Point Development Programme

FRIGIDAIRE means business—for you!

Regd. T.M.

FRIGIDAIRE DIVISION OF GENERAL MOTORS LTD., STAG LANE, KINGSBURY, N.W.9

AND NOW

Caxton on tap!

We don't merely advocate progress—we promote it! Here as proof is our new road tanker, designed specifically to pipe liquid chocolate straight into your plant. The labour-saving advantages are obvious. The carrying and breaking of blocks, and the melting procedure are eliminated. Staff at present employed in these departments can be usefully transferred elsewhere . . . space saved can be used to provide increased production facilities In short, a continuous line flow process is a "must" for every manufacturer who believes in automation and parallel developments.

Our Technical Advisory Service will be pleased to assist you with plans, advice and demonstrations so that you may profit from the advantages of liquid bulk delivery at the earliest possible opportunity. Why not get in touch with us, immediately?

CONSULT

Caxton

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CAXTON CHOCOLATE COMPANY LIMITED · LONDON · N.22

I didn't know there were two of us!

RASPBERRY N.F.
37/6 per lb.

Centres & Creams 6 ozs. per cwt.

A natural extract of quality

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FLAVOURS *are so much better!*

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collapsible tubes
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The perfect hairdressing
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EYE OINTMENT
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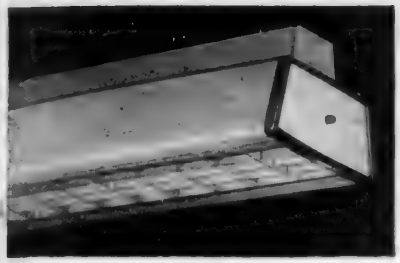
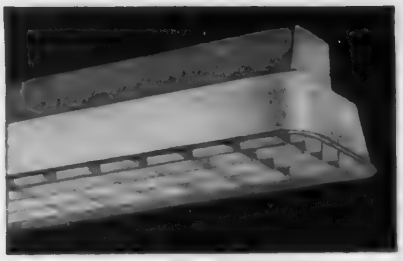
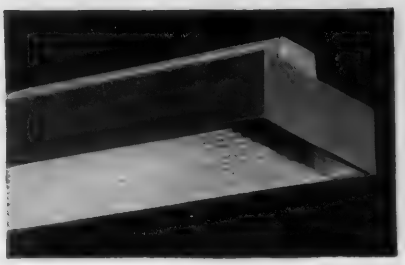
CODOPYRIN
FERSOLATE
PRESSURE GAUGE

t's so new about
resistant fittings







these anyway?

Everything is new! *The '101 Range' is an entirely new range of contemporary styled industrial, commercial and decorative fluorescent fittings. The successful result, in fact, of team work between G.E.C. fittings designers and illuminating engineers. Competitively priced—outstandingly modern in conception! NEW also is the introduction of basic channels for single or twin tubes, 1½ ft. to 8 ft. which, with specially designed attachments, form an interchangeable system of great versatility with particularly simple installation and maintenance. It is important that you learn all about this exceptional range —the '101 Range'—of G.E.C. fluorescent fittings, so write for fully descriptive catalogue No. F 4068.*

new adaptability

The G.E.C. '101 Range' sets a *new standard* of adaptability. Using as a basis, channels of common cross section, industrial, commercial and decorative fittings are built without a multitude of small parts. Each is a soundly engineered fitting, of modern appearance and incorporates many aesthetic and mechanical refinements. Installation and maintenance are absolutely simple.

new reflectors

For the first time the industrial user can have vitreous enamelled closed end trough reflectors made from a single pressing, with well-rounded corners and without joints. They are therefore particularly easy to clean. New techniques enable them to be made lighter than previous types and therefore easier to handle and less susceptible to damage.

new 8 ft. tubes

Recessed double contact (R.D.C.) caps are fitted to OSRAM 8 ft. 125 w. tubes for use in the '101 Range'. This new cap design protects the tube ends and allows replacement by one person from one ladder position. Recessed double contact caps also provide firm, reliable support and location for these tubes without relying on contact pins or independent clips. This results in easier tube replacement after cleaning or maintenance. Unsightly shadows are reduced, as the new cap gives a smaller "dead region" at tube ends. Osram Guaranteed Tubes, with their freedom from early failures, are recommended for all G.E.C. lighting fittings.

G.E.C. range 101

fluorescent fittings

THE REALITY OF A COMPLETE LIGHTING SERVICE

MALT PRODUCTS

A THOUGHT FOR FOODS

Protein additions?

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Starch conversion?

Fermentation balance?

Flavour development?

Laboratory media?

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Maltsters for more than a Century

Dancers
$2\frac{1}{4}" \times 8\frac{1}{4}" \times 2"$

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By METAL BOX in 1958

YOU CAN BUY AS FEW AS 10 DOZEN—
or as many as you like!

Moderne
$8" \times 5" \times 2\frac{1}{4}"$

These are 'Dancers' and 'Moderne', two of the variety of attractive stock boxes offered by Metal Box in different designs, shapes and sizes. There is an appropriate container for tea and almost every bakery or confectionery product; each beautifully made and embellished with high quality colour printing protected by hard gloss varnish.

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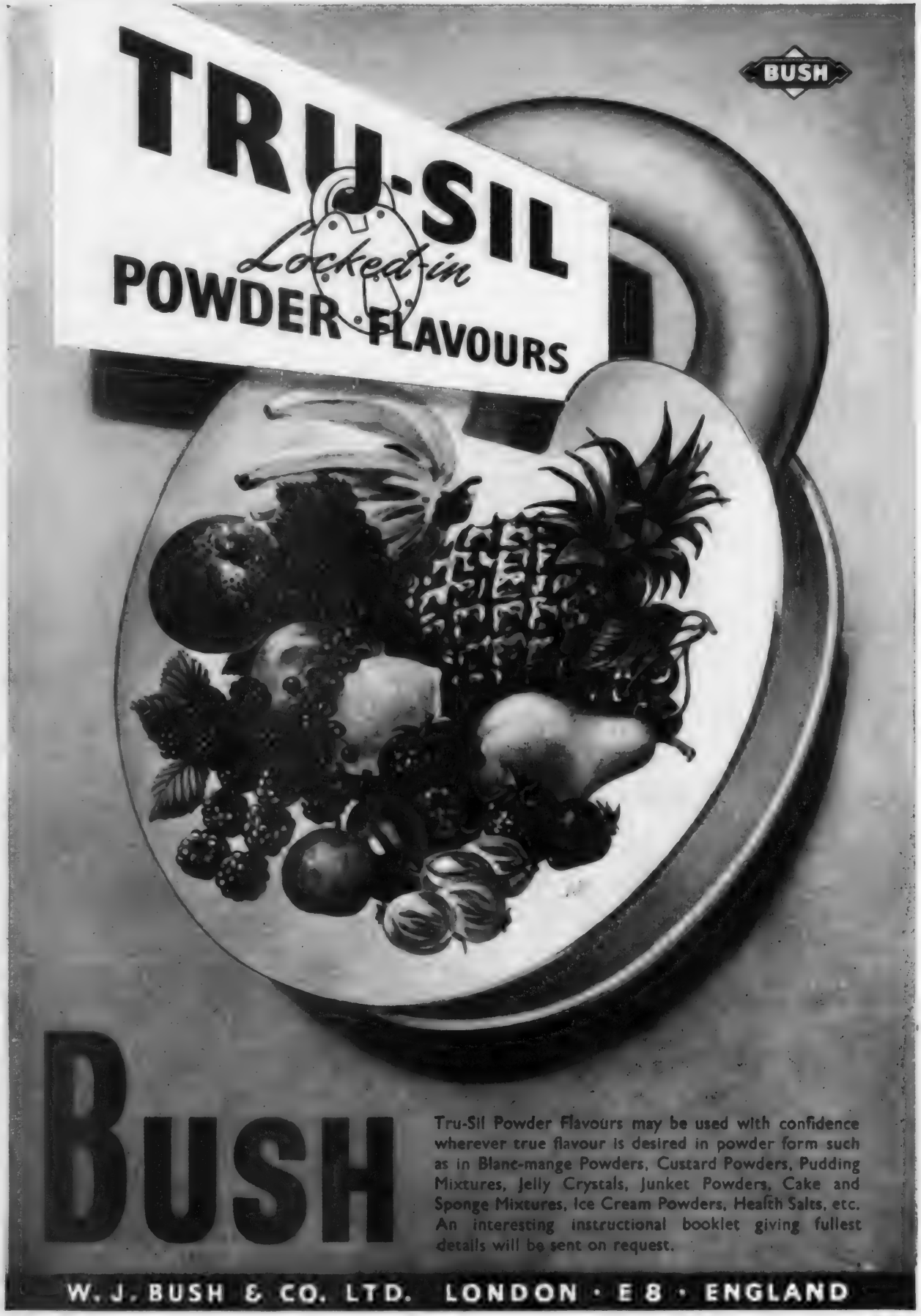
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BUSH
Tru-Sil Powder Flavours may be used with confidence wherever true flavour is desired in powder form such as in Blanc-mange Powders, Custard Powders, Pudding Mixtures, Jelly Crystals, Junket Powders, Cake and Sponge Mixtures, Ice Cream Powders, Health Salts, etc. An interesting instructional booklet giving fullest details will be sent on request.
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55/59

SecuRO

THE LATEST R.O. TAMPERPROOF SEAL

★ SECURO SEAL BEFORE FIXING

★ SECURO SEAL FIXED & TAMPER-PROOF... READY FOR TRANSIT

UNIQUE DESIGN OF SECURITY BAND BRINGS ADDITIONAL ADVANTAGES

Hundreds of firms have proved the effectiveness of the R.O. Pilferproof Bottle Closure, and now here is the SecuRO Seal to give even greater security as well as the following advantages.

1 The SecuRO Seal has a right-hand thread and the Security Band a left hand thread making it easy to break the perforated portion.

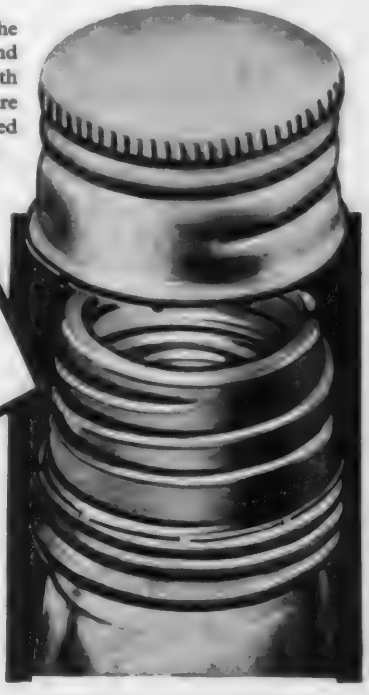
2 The Security Band can be readily unscrewed and disposed of without cutting.

3 The SecuRO Seal is 100% tamperproof.

4 The SecuRO Seal has a greatly enhanced appearance.

The SecuRO Seal can be applied by any R.O. Sealing Machine suitably adapted. A small change in the glass finish will be necessary but this can easily be effected.

The tell-tale 'click'. When the SecuRO Seal is unscrewed, cap and Security Band part company with an unmistakable 'click' to assure the customer that he has received the contents intact and undiluted.



★ *SECURO SEAL BROKEN BY THE CONSUMER*

But instead of Band dropping down neck of bottle, it remains on thread and may be removed by unscrewing!

METAL CLOSURES LTD

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- *Available from stock*
- *Totally enclosed fan cooled*
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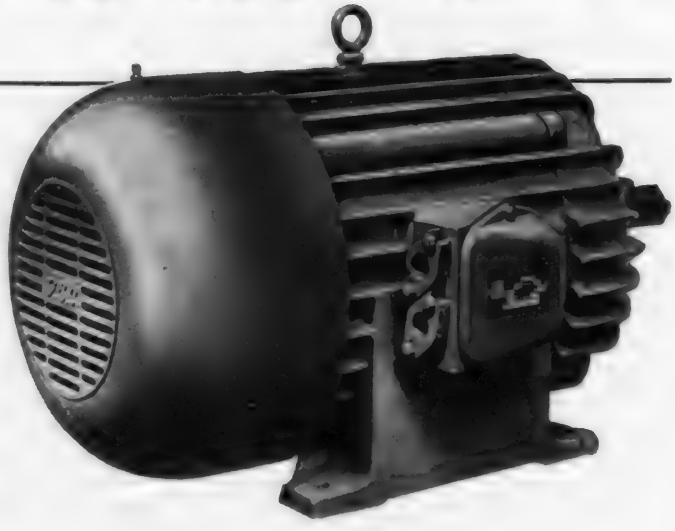
- *Six leads brought out to terminal box*
- *Outputs up to 25 h.p.*
- *Double impregnation*
- *For normal duty in any part of the world*
- *Standard dimensions to B.S. 2083 (1956)*

a lifetime of service...



G.E.C.

motors

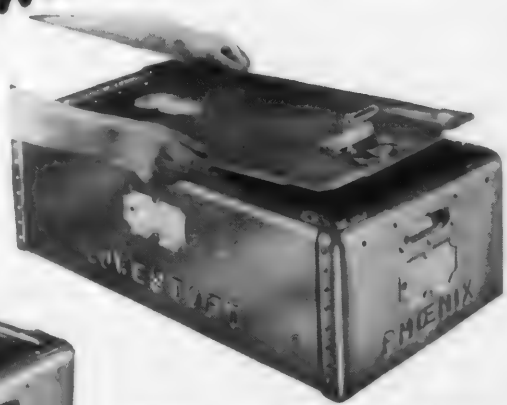
Ask for Technical Description No. 431

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

Deliver your product fresh and safe!

in a PHŒNIX ALUMINIUM TRANSIT CASE

HESTON EQUIPMENT CO. LTD.



In three sizes with or without lids. Embossed to your requirements.

Whatever your product — 'PHOENIX' Aluminium Transit Cases will ensure delivery in a satisfactory condition. Designed to satisfy general handling needs in the transport of all foods and commodities. Hygienic Aluminium—Lightweight—Easily cleaned.

THE *LATEST* DEVELOPMENT

in Plastic materials will prove our newest trays to be the answer to problems where metal or wood is not satisfactory.

Hygienic—odour-proof—Feather-weight lightness, Non-toxic—practically indestructible. Interstacking or nesting. In various colours.

Don't delay in requesting full information about these ***NEW*** type trays.

Enquiries and full details from Dept., F.M.

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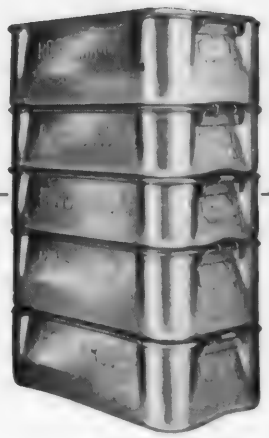

HYGIENE puts YOU on OUR metal!

ALUMINIUM

Lidded Transport Containers

Hygienic One-Piece Pressing

Positive Stacking with Lids

Complete Outside Draining Facilities (optional)

Definite Lid Security

Designed for the ROSS GROUP—World known for their enterprise and advanced methods in Fish Handling Transport.

3 STONE PLUS ICE: CAT. No. PCL.28156
(Internal Dims. 27½" × 14½" × 6½")

5 STONE PLUS ICE: CAT. No. PCL.28158
(Internal Dims. 27½" × 14½" × 8½")

Reg. Design No. 882252.

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A MEMBER OF THE ALMIN GROUP

BIRMINGHAM ROAD, WARWICK TELEPHONE: WARWICK 693-696

It's a long way to the counter . . .

It's a long way to the Shopman's counter, but that is where these spruce logs will eventually reappear—as boxes made from SCANDINAVIAN Pure Folding Box Board. The boxes will contain sensitive commodities which need a taint-proof packing. The purity of SCANDINAVIAN is a guarantee of a faultless packing for such products—and it may save bulk, and cost too, by dispensing with protective linings.

Besides its hygienic and protective qualities SCANDINAVIAN is superior in lightness, whiteness and rigidity, and presents an admirable surface for printing.

SCANDINAVIAN is specially recommended for use in the packaging of

FOODS
CONFECTIONERY
PHARMACEUTICALS
COSMETICS
TOBACCO

because it is clean, odourless, hygienic, because it can save the expense of protective linings and may be used with confidence for the most sensitive materials.

Many standard grades available. Special weights produced to order. The Mills and their agents welcome enquiries, delight in dealing with individual problems.

'SCANDINAVIAN' PACKING FOR SENSITIVE PRODUCTS. The name 'SCANDINAVIAN' guarantees a pure virgin-fibre folding box board made by the following mills in Finland, Norway and Sweden :

ANKER, DJUPAFORS, FRIDAFORS, INLAND, KYRO, MESNA, OPPBOGA, ÖREBRO, RENA, SAEVAREID, SIMPELE, SVANEHOLM, TAKO.

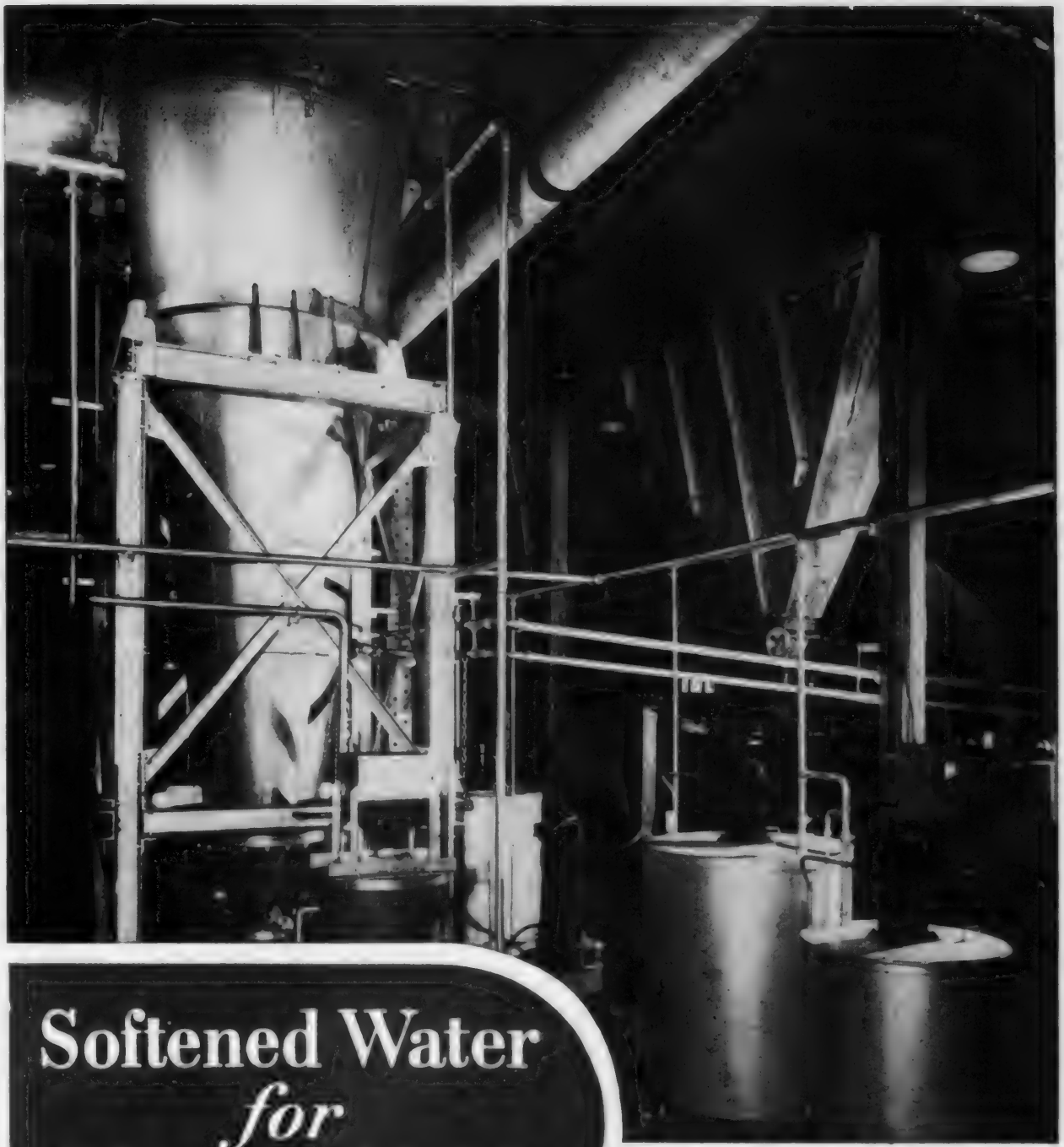
SCANDINAVIAN

PURE FOLDING BOX BOARD

U.K. agents for the above mills can give you full information.

IN CASE OF DIFFICULTY WRITE TO THE INFORMATION AND RESEARCH DEPARTMENT, P.O. BOX 7232, STOCKHOLM 7.

CVS-I5



Softened Water *for* BOILER FEED by PERMUTIT

Consistent zero-hard softened water for boiler feed is supplied by "Spiractor" cold lime softener followed by a Permutit Ion Exchange softener. This is only one of a range of Permutit plant designed to supply correctly treated boiler feed. If you require further information on Permutit boiler feed water treatment plant, please write to :—

The PERMUTIT COMPANY LTD. Dept. W.L. 272, Permutit House, Gunnersbury Avenue, London, W.4

Telephone : CHIswick 6431

A MEMBER OF THE LARGEST DAIRY ORGANISATION

WILTS UNITED DAIRIES

No. 2 BUCKINGHAM

MILK PROCESSING THE MODERN WAY

A view of the Buckingham factory in its green and pleasant setting.

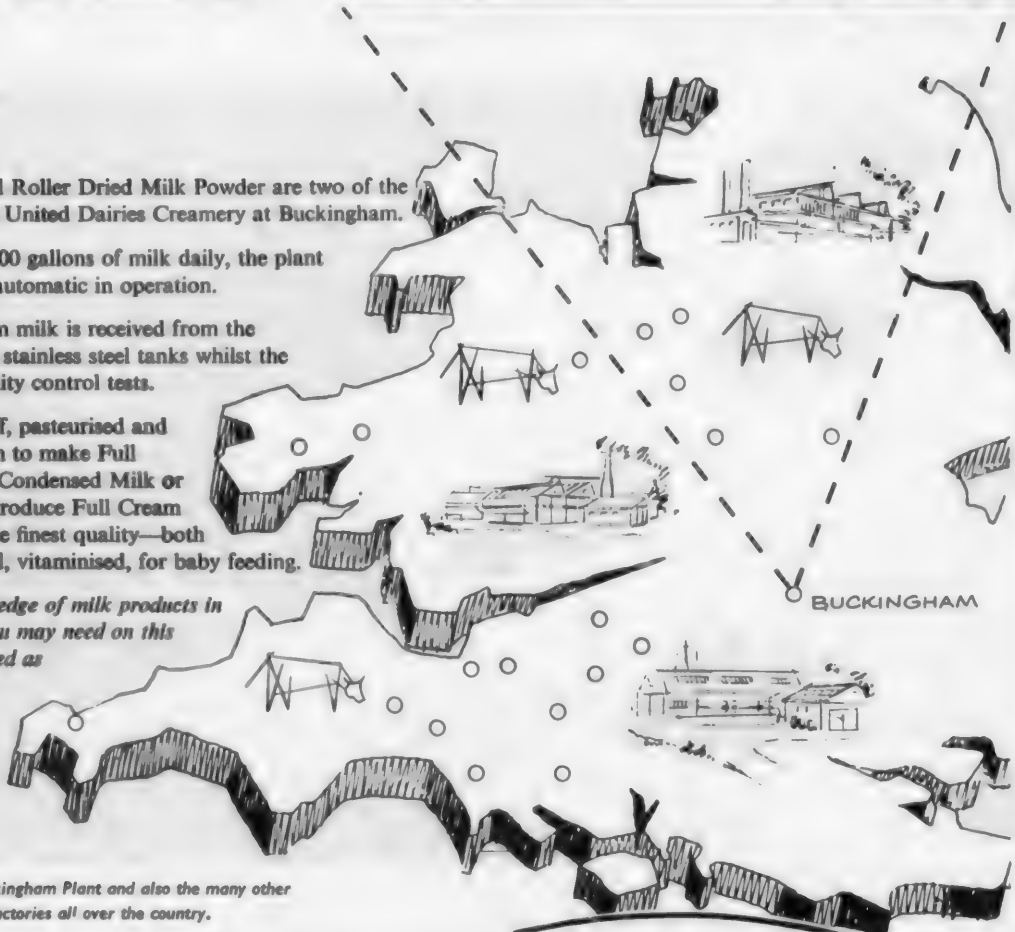
Sweetened Condensed Milk and Roller Dried Milk Powder are two of the products produced at the Wilts United Dairies Creamery at Buckingham.

Capable of handling up to 30,000 gallons of milk daily, the plant at Buckingham is almost fully automatic in operation.

Immediately the fresh full cream milk is received from the farms it is cooled and stored in stainless steel tanks whilst the Laboratory carry out their quality control tests.

From these tanks it is drawn off, pasteurised and either evaporated under vacuum to make Full Cream or Skimmed Sweetened Condensed Milk or it is fed to the giant rollers to produce Full Cream or Skimmed Milk Powder of the finest quality—both for manufacturing purposes and, vitaminised, for baby feeding.

WILTS have an unequalled knowledge of milk products in this country; any information you may need on this subject is freely and gladly offered as part of their service.



This map shows the position of the Buckingham Plant and also the many other Wilts United Dairies Creameries and Factories all over the country.

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PRODUCED AT BUCKINGHAM:
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And, of course, Butter, Cheese, Cream and all other Dairy Products

WILTS

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Trowbridge · Wiltshire
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A view of the precondensed milk in the trough of a roller drier.

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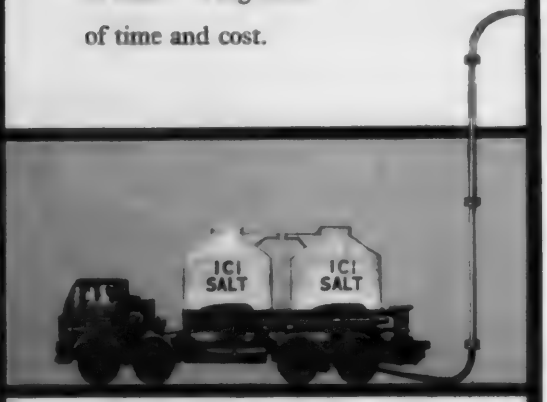
Seven tons of Pure Dried Vacuum salt can be pumped through this pipe within thirty minutes — straight into your saturator or silo! I.C.I.'s new air-discharge vehicles cut out all shovelling of loose salt, and man-handling of bagged salt. It's the modern hygienic way to buy salt in bulk — a big saver of time and cost.



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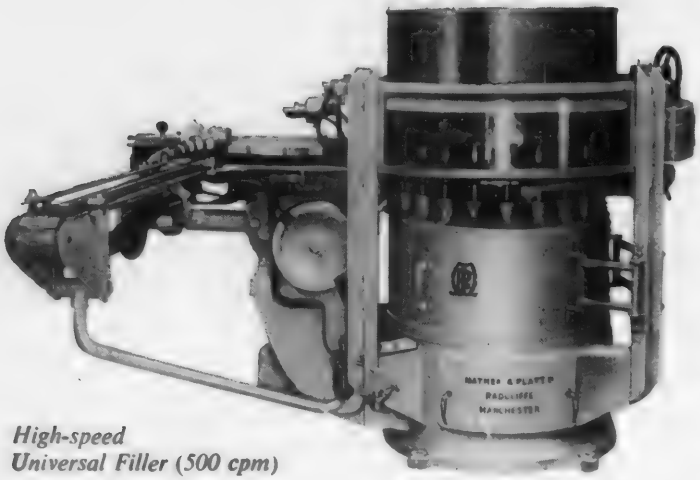
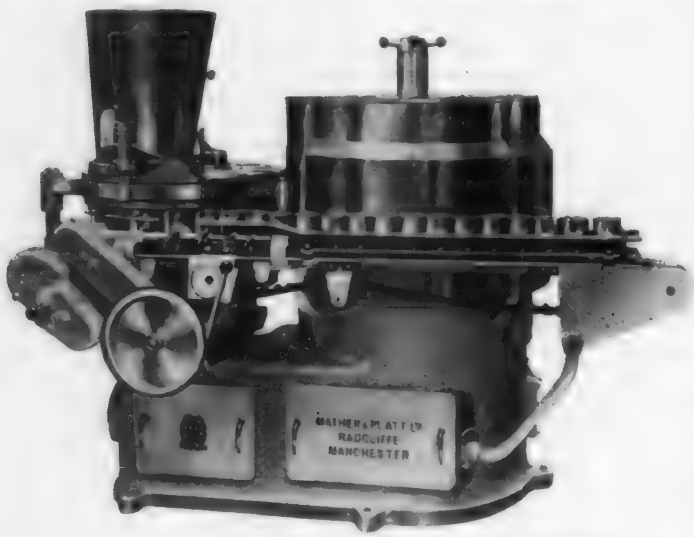


High-speed Universal Filler (500 cpm)



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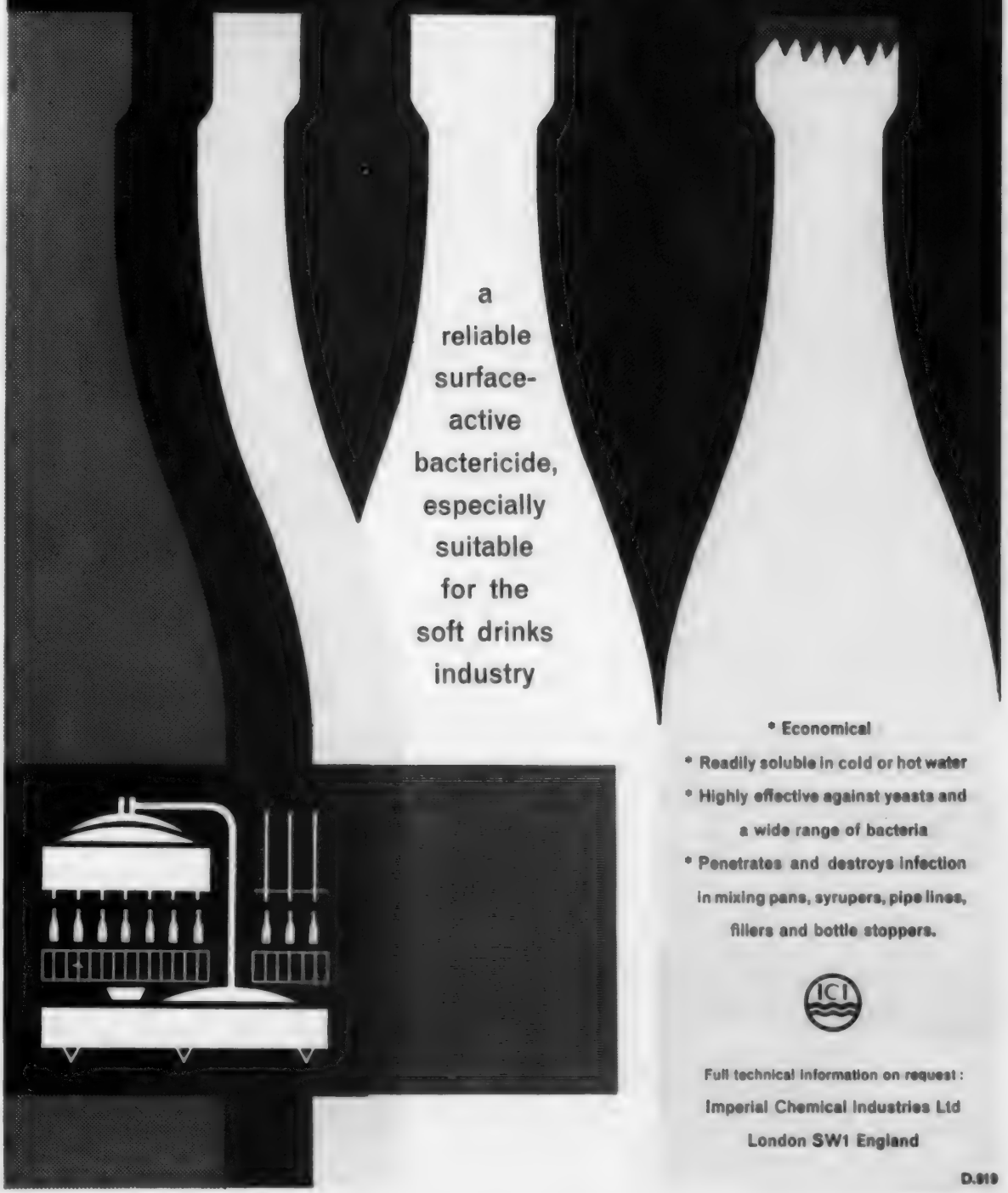

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CCT 65-6-120

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There's nothing like "Cellophane" film to keep food fresh and to protect it from dirt, dust and grease.

For extra packaging convenience use "Cellophane" film bags. And for putting over your name and sales-message, there's nothing to equal colour-printed "Cellophane" film. We can put you in touch with the best film-printers and bag-makers—such as our associated company, Colodense Limited of Bristol.

In particular, the new MXXT "Cellophane" — the most moistureproof film in the world—will guard the freshness of the most "difficult" products for long periods. The exceptional sparkle and freedom from wrinkling of MXXT film gives packs special eye-appeal.

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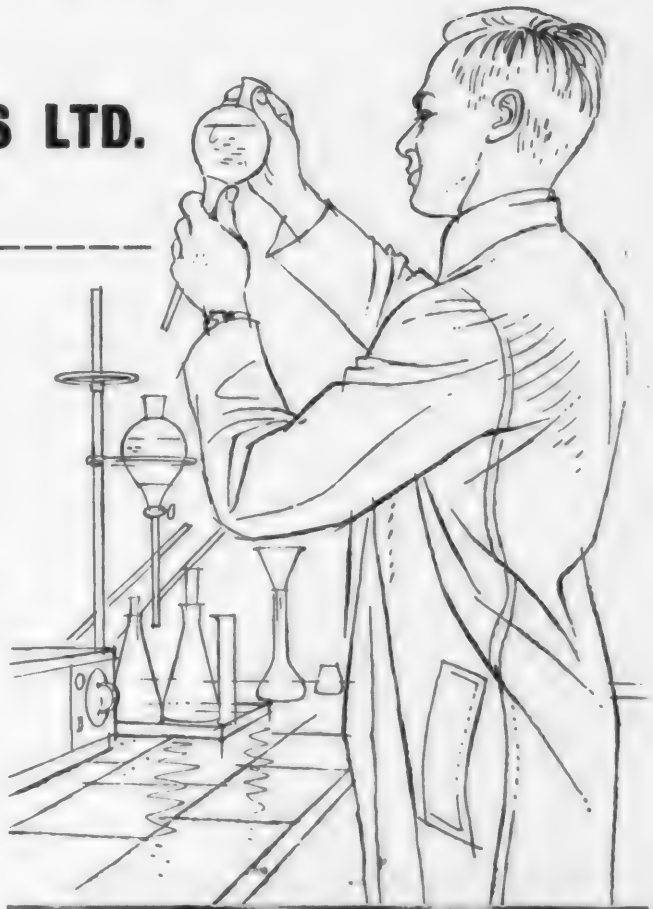
"Cellophane" is the registered trade mark of British Cellophane Limited and denotes the brand of cellulose film manufactured by them.

Powermaster at work

Case History No. 5

GLAXO LABORATORIES LTD.



Powermaster Packaged Oil-fired Boiler provides the close boiler firing control necessary for research work at Glaxo Laboratories.

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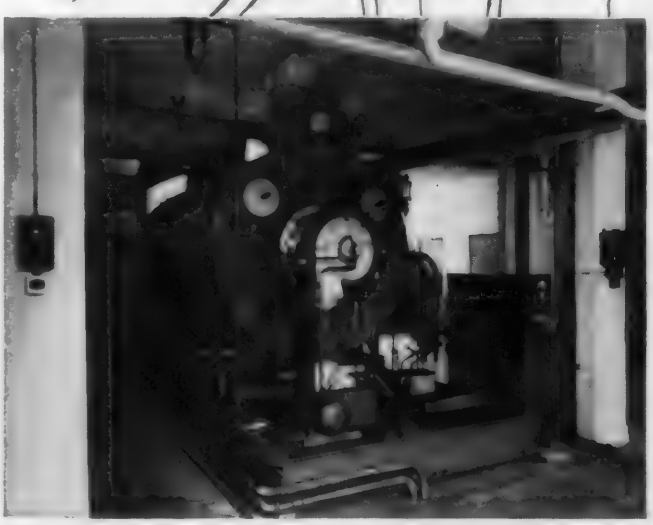
Powermaster Boilers have proved a money saving investment for every kind of business and industry. Write for the Powermaster Bulletin.



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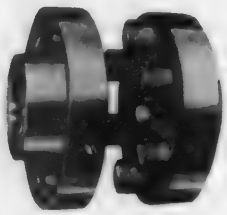

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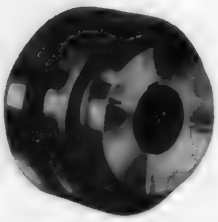

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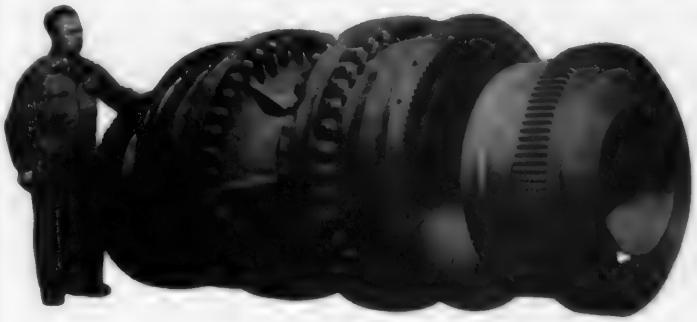

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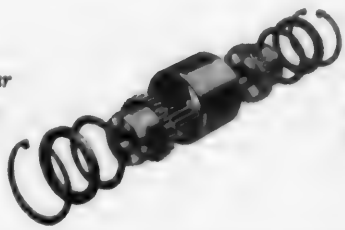

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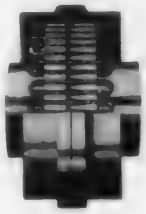

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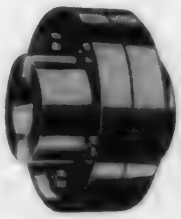

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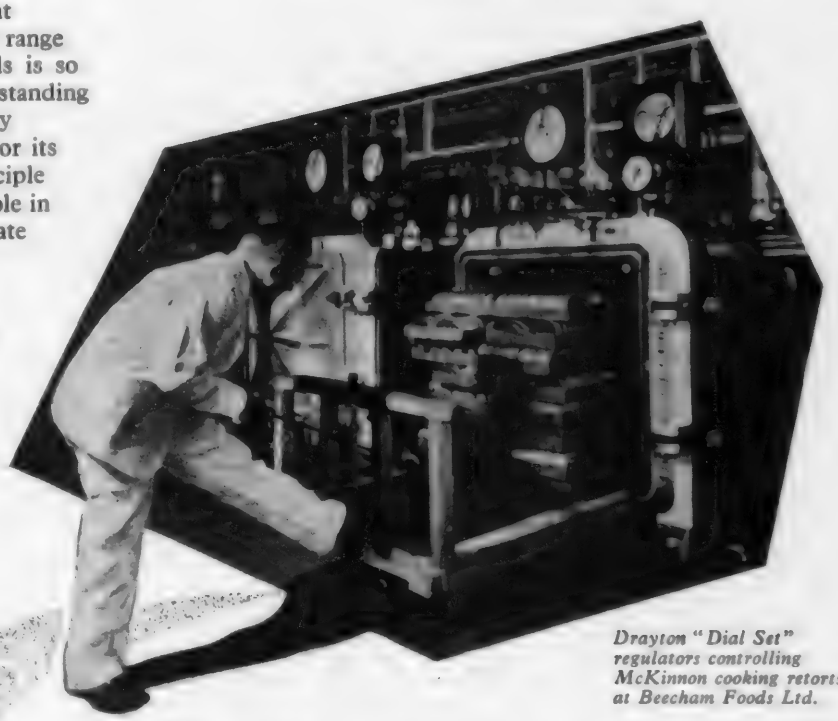

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★ *Capacity: 50 to 1,500 gallons according to viscosity.*

★ *Twenty-five variations of power and speeds to suit most requirements can be supplied.*

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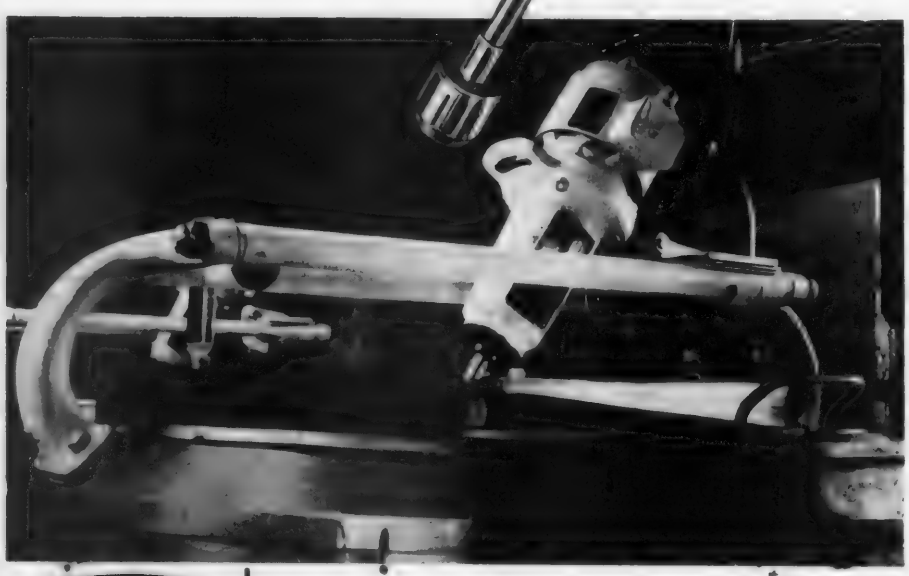

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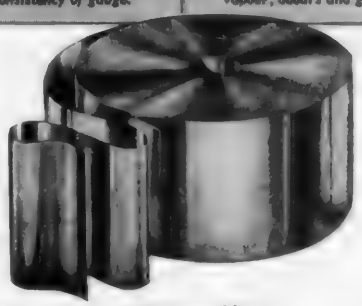

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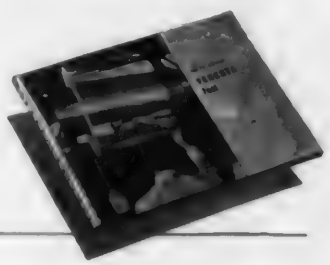

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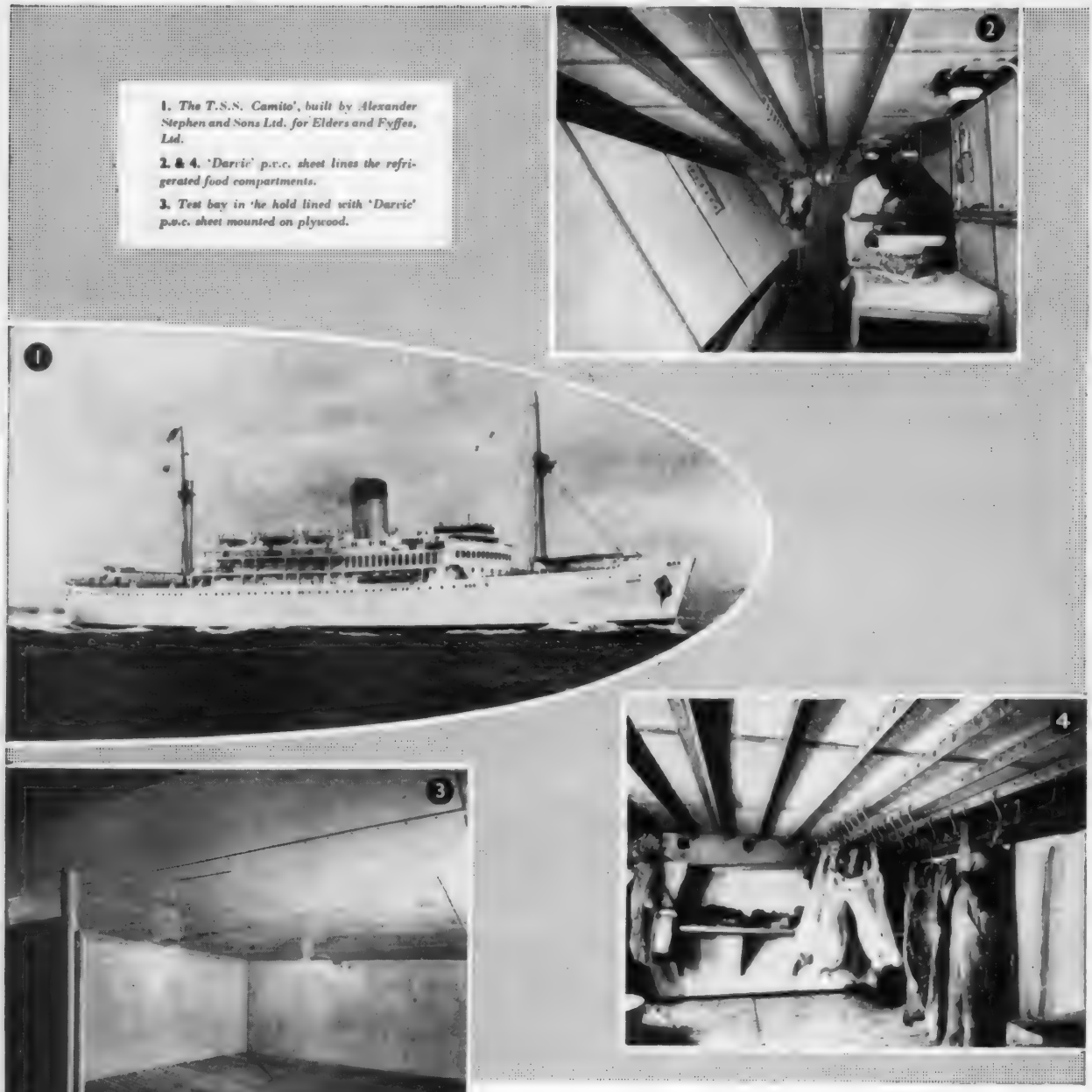


1. *The T.S.S. Camito', built by Alexander Stephen and Sons Ltd. for Elders and Fyffes, Ltd.*

2. & 4. *'Darvic' p.v.c. sheet lines the refrigerated food compartments.*

3. *Test bay in the hold lined with 'Darvic' p.v.c. sheet mounted on plywood.*

Why 'Darvic' was chosen for T.S.S. 'Camito'

THIS DURABLE, HANDSOME MATERIAL was chosen because it combines many valuable properties. Its low thermal conductivity makes it ideal for lining refrigerated rooms and cabinets; it is also completely odourless and does not taint food or drink. 'Darvic' p.v.c. sheet is light, long-lasting and easy to keep clean. It is rigid even in thin sheets, has high impact strength and resistance to corrosion. Complete 'Darvic' interiors are now installed in some nationally known refrigerators and the applications of this versatile sheet are increasing in marine engineering.

'DARVIC'

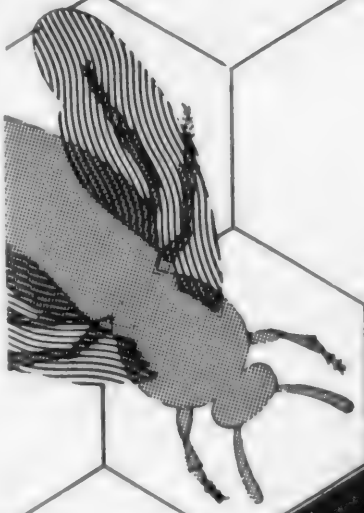
'Darvic' is the registered trade mark for the rigid P.V.C. sheet manufactured by I.C.I.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON · S.W.1

PD.35

ON THE INSIDE...



THE inside, not of a honeycomb, but of a Pfaudler glassed-steel vessel is a most important feature. It is, of course, the fused glass lining ensuring absolute cleanliness for a product and freedom from contamination.

The Enamelled Metal Products Corporation have recently had the pleasure of supplying Messrs. The Bear Honey Co. Ltd. with a 300 gallon Pfaudler open 'L' series vessel and two 350-gallon Pfaudler glassed-steel steam jacketed vessels, both with motor-driven agitators, for the blending of their famous Honey.

Pfaudler

ENAMELLED METAL PRODUCTS CORPORATION (1933) LTD.

Artillery House, Artillery Row, London, S.W.1 and Durie Foundry, Leven, Fife.

ONE OF THE GROUP OF COMPANIES

E 2047

METAMIX VARI-SPEED AGITATORS *TYPE F.S.V.*

Model No	HP	A	B	C	Approx. Capacity
1	½	2'–0"	2½"	3"	50 Gal
2	½	2'–6"	2½"	4"	170 Gal
3	1	3'–6"	3½"	6"	750 Gal
4	1½	4'–6"	3½"	7"	950 Gal
5	2	4'–6"	3½"	8"	1300 Gal

METAMIX LOW-SPEED AGITATORS *TYPE F.S.G.*

Model No.	HP	A	B	C	Approx. Capacity
1	½	2'–6"	2½"	3"	100 Gal
2	½	3'–0"	2½"	4"	175 Gal
3	1	3'–6"	2½"	5"	500 Gal
4	1	4'–0"	3½"	6"	750 Gal
5	1½	5'–6"	3½"	7"	950 Gal
6	2	5'–6"	3½"	8"	1350 Gal

better mixing an greater control

Metamix Agitators are the result of long experience of the requirements of efficient mixing. The marine type propeller and the shaft are of stainless steel to B.S.S. EN. 58VJ the propellers being readily adjustable to any desired position. Type F.S.G. can be supplied with single or double reduction gear, propeller shaft angles are adjustable in both types. Of streamlined clean design the units can be supplied vitreous or stove enamelled to suit match plant.

★ ***ADJUSTABLE***
to suit plant location and mixing vessel

★ ***MARINE TYPE PROPELLER***
provides more efficient agitation

★ ***TOTALLY ENCLOSED***
ensuring absolute cleanliness

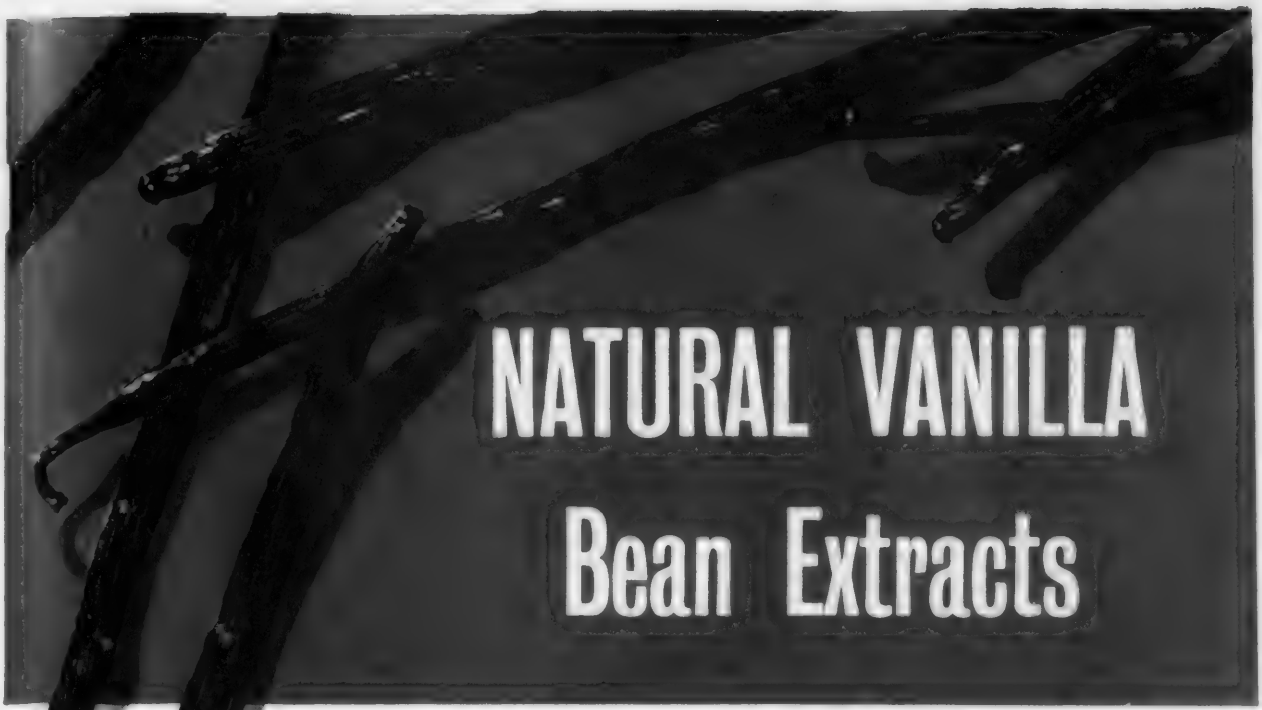
METAMIX AGITATORS

full specifications gladly supplied on request.

METADUCTS LIMITED

CATHERINE WHEEL ROAD · BRENTFORD · MIDDLESEX · TEL EALING 3678

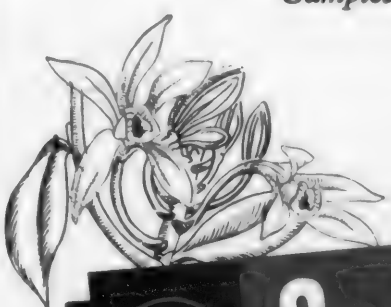
A MEMBER OF THE CMC GROUP OF COMPANIES



NATURAL VANILLA Bean Extracts

StaffordAllenS Vanilla Extracts are pure extractives of the finest beans. For the true flavour of natural vanilla they are unsurpassed.

Samples will gladly be sent on request.



StaffordAllenS

STAFFORD ALLEN & SONS LTD., WHARF ROAD, LONDON, N.1

'Phone: CLErkenwell 1000 (7 lines)

Telegrams: Stafalens, Nordo, London

TAS/AL 589

UGB

For quality and service

UNITED GLASS BOTTLE MANUFACTURERS LTD.

8 LEICESTER ST., LONDON, W.C.2 *Tel.*: Gerrard 8611 (23 lines) *Grams.*: Unglaboman, Lesquare, London.

Without a shadow...of doubt

install BENJAMIN REGD. Flurolier Lighting Fittings

To meet Industrial demands for the highest level of illumination in factories, The Benjamin Electric Ltd., offer a range of Flurolier Fittings—in single or continuous runs—for fluorescent lighting. Unobtrusive in appearance, Flurolier Fittings provide a cut-off in accordance with factory regulations; are adaptable to every method of installation; have an exclusive lampholder design and are easily detached for cleaning or maintenance. All in all, Flurolier Fittings are industries' choice *without a shadow of doubt*. *Please send for full details of the complete Flurolier range.*

FOR CONSTANT, HARDWEARING PROTECTION FLUROLIER REFLECTORS ARE FINISHED IN 'CRYSTEEL' VITREOUS ENAMEL WHICH GIVES A PERMANENTLY WHITE, HIGHLY REFLECTIVE SURFACE.
FOR LESS ARDUOUS CONDITIONS ASK ABOUT 'PEROPAL' FINISH.

Better lighting by BENJAMIN REGD

THE BENJAMIN ELECTRIC LTD · TOTTENHAM · LONDON N.17
PHONE: TOTTENHAM 5252 (5 LINES) · GRAMS: BENJALECT SOUTHTOT LONDON
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Smee's 117

C & T HARRIS
(CALNE) LIMITED
(Manufacturers of the celebrated
HARRIS WILTSHIRE SAUSAGES
—as good as their famous bacon)

praise their

SEYDELMANN SUPER CUTTERS!

Read what they have to say

"We have found the Seydelmann cutting machine a first rate job in the preparation of our top quality products. It has given us high speed production with a very low rate of rise in temperature of the material being chopped and the maintenance required has been very low indeed".

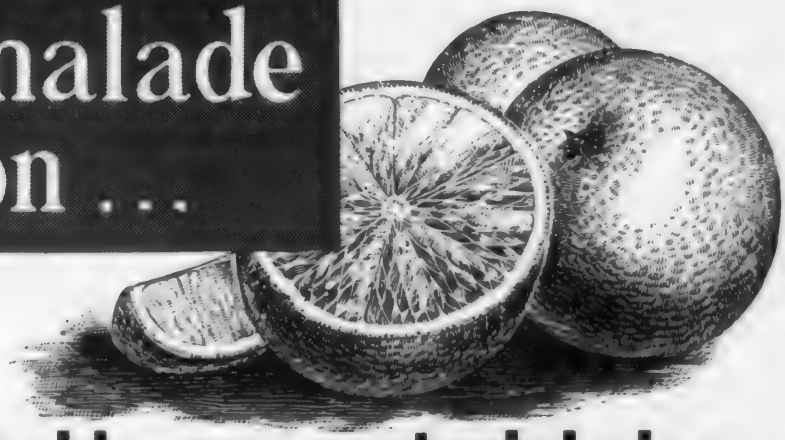
C. & T. HARRIS (Calne) Limited

Other important firms now using Seydelmann Cutters include:—

CO-OPERATIVE WHOLESALE SOCIETY LTD., LOWESTOFT · MESSRS. JOHN GARDNER LTD., GLASGOW · ALFRED E. JONES LTD., LIVERPOOL MESSRS. DRINGS LTD., WEMBLEY · MCGROUTHER LTD., STIRLING IPSWICH CO-OPERATIVE SOCIETY LTD.

STOKES & DALTON LTD., Victoria Spice Mills, Leeds 9 Tele: 31701 (10 lines)

Marmalade season . . .



Offset probable raw material rises by installing the Kellie automatic

"4 in ONE"

CUTS LABOUR COSTS BY 90%

Oranges, Lemons, Tangerines, Grape Fruits, etc., from 1¼" to 3½" diameter cut automatically into quarters, irrespective of shape. No Grading required.

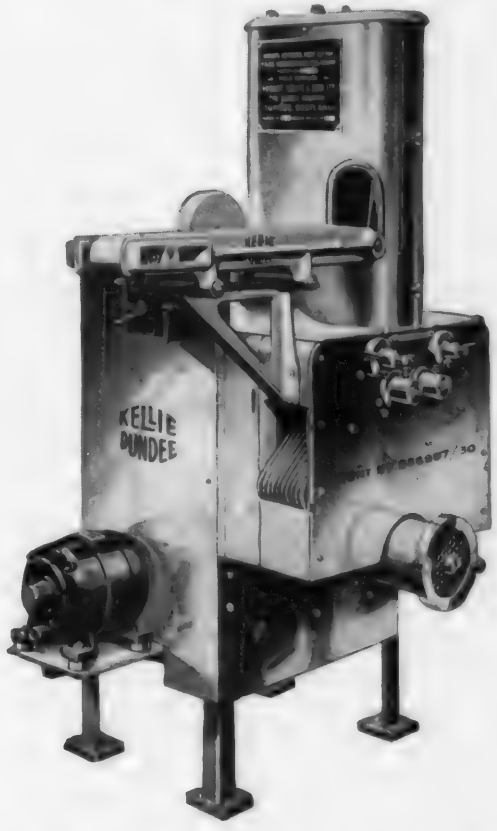
The fruit is automatically pulped, and the peel is separated to any required thickness from 3/16" to ¼", ready for shredding.

Thickness of peel instantly adjustable, micrometer accuracy being guaranteed; an absolutely clean peel, or one with a small proportion of pulp is obtainable at will.

Peel, fruit pulp and juice are delivered separately at 12 lbs. per minute. The labour costs for this output SHOW A REDUCTION OF OVER 90% over handwork. This alone would enable the cost of the machine to be recovered in a few weeks.

The risk of skin disease to workers is absolutely eliminated with this machine.

Arranged for direct coupled electric motor or belt drive with fast and loose pulleys.



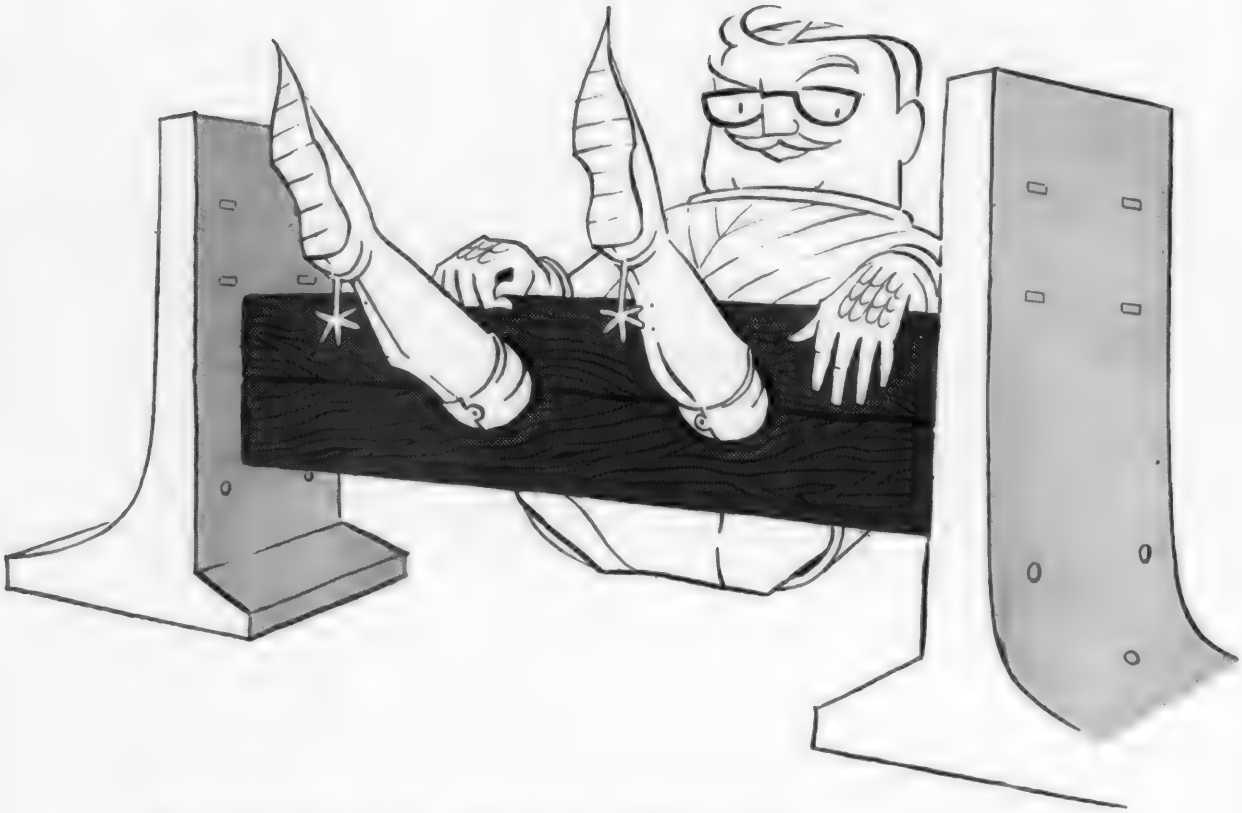
This Kellie

1 QUARTERS
2 PEELS
3 SEPARATES
4 PULPS

ROBERT KELLIE & SON LIMITED DUNDEE SCOTLAND

Telephone: Dundee 2819 (2 lines)

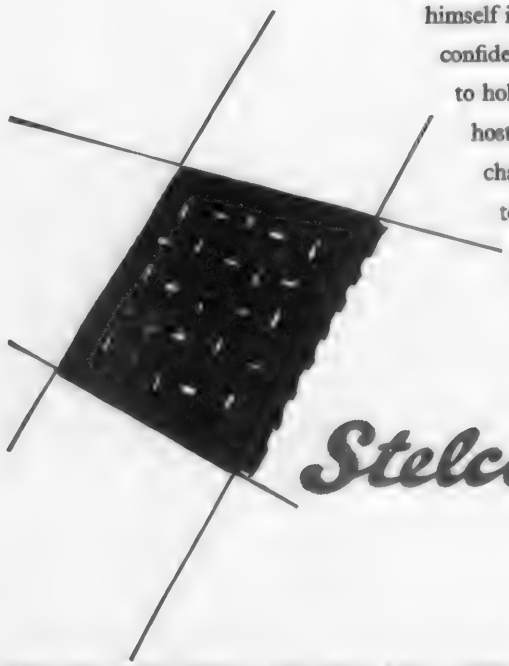
Telegraphic and Cable address: "Kellie" Dundee. Code A.B.C. (5th Edn.)



Anchor(ed) Steel Plates!

Our Sales Director is quite willing to make a laughing stock of himself in the cause of Stelcon. So here he rests awhile, confident in the ability of Anchor Steel Plates to hold the floor year in, year out, no matter how hostile the traffic. Indeed, the Saucy Knave challenges you to throw anything you like at them as a test ("Not that tomato, sir, if you please . . . the pips get in my joints, so!")

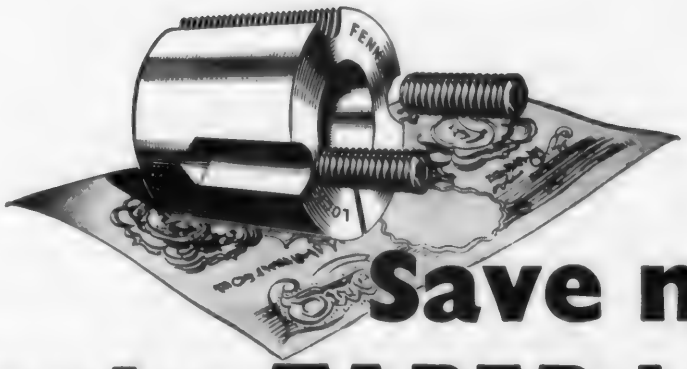
Stocks by courtesy of Stelcon's famous Storage Walls.



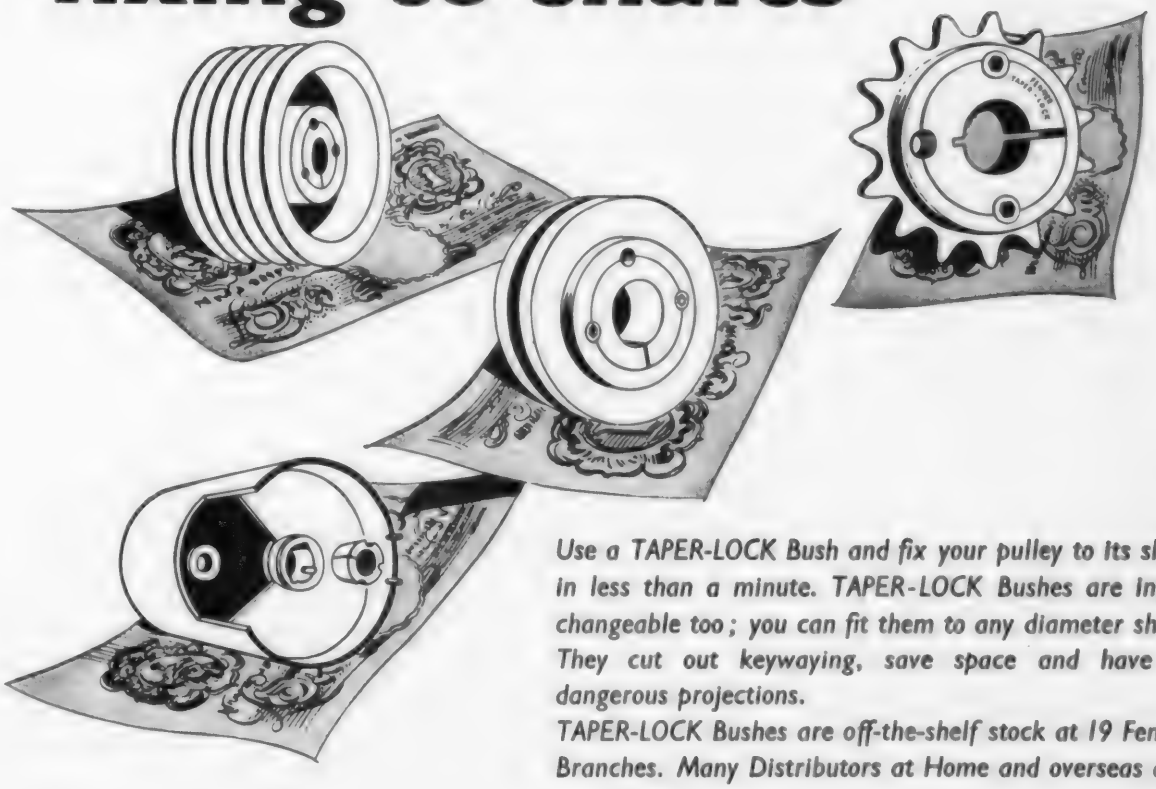
Stelcon *FLOORS GIVE INDUSTRY A FIRM FOUNDATION*

ANCHOR STEEL PLATES, STEEL CLAD FLAGS AND RAFTS.

STELCON (INDUSTRIAL FLOORS) LTD., DEPT. F · CLIFFORDS INN · LONDON E.C.4 · TEL: CHAncery 9541



Save money— make TAPER·LOCK your standard method of fixing to shafts



Use a TAPER-LOCK Bush and fix your pulley to its shaft in less than a minute. TAPER-LOCK Bushes are interchangeable too; you can fit them to any diameter shaft. They cut out keywaying, save space and have no dangerous projections.

TAPER-LOCK Bushes are off-the-shelf stock at 19 Fenner Branches. Many Distributors at Home and overseas also stock them.

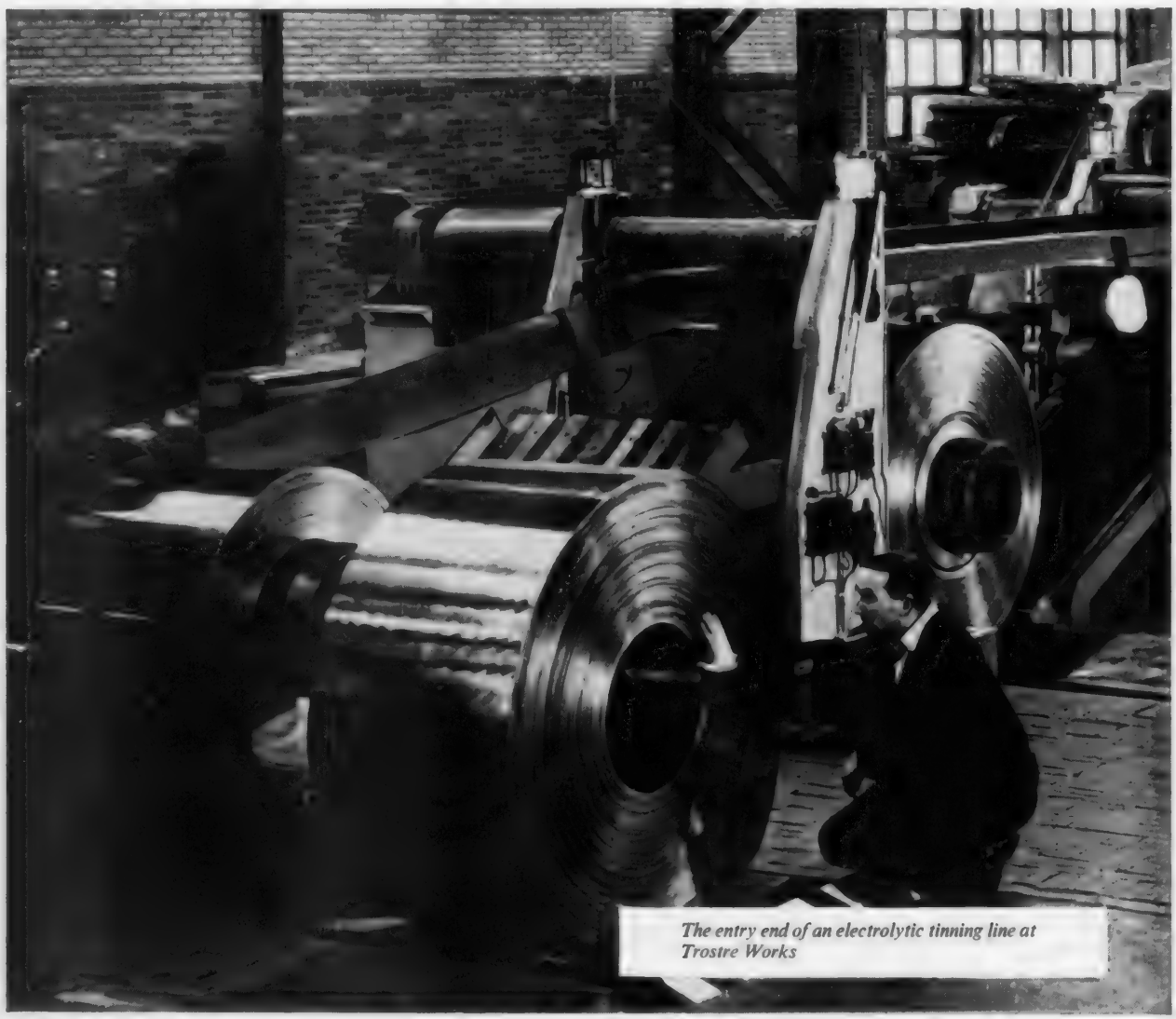
J · H · FENNER & CO · LTD · HULL

BRANCHES AT: BELFAST, BIRMINGHAM, BRADFORD, BRISTOL, BURNLEY, CARDIFF, GLASGOW, HULL, LEEDS, LEICESTER, LIVERPOOL, LONDON, LUTON, MANCHESTER, MIDDLESBROUGH, NEWCASTLE-ON-TYNE, NOTTINGHAM, SHEFFIELD, STOKE-ON-TRENT.

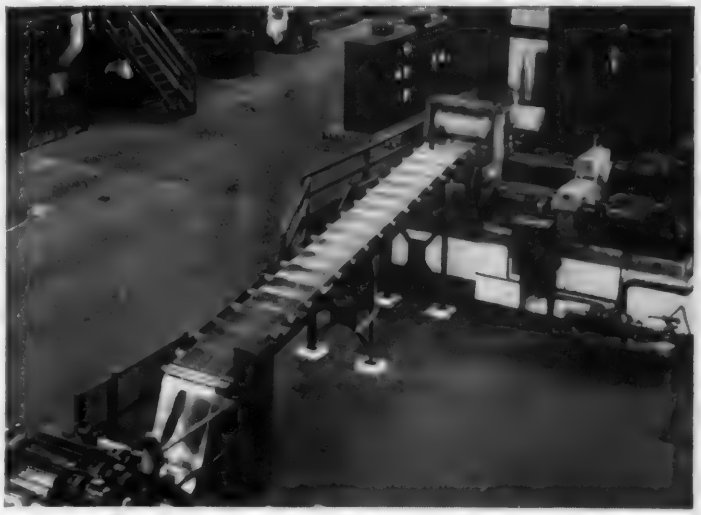
LARGEST MAKERS OF V-BELT DRIVES IN THE COMMONWEALTH

Two-thirds of Britain's TINPLATE is made by

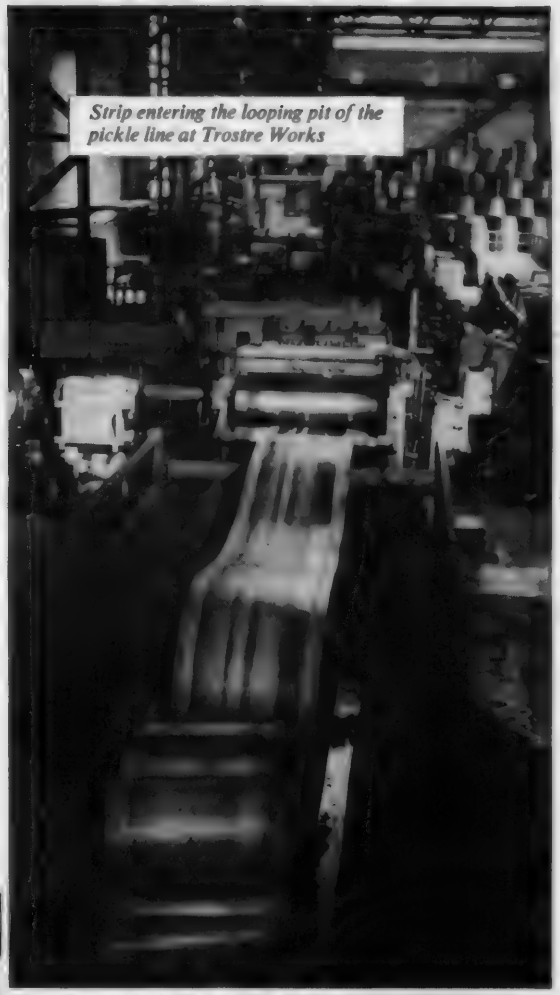
THE STEEL COMPANY OF WALES LIMITED



The entry end of an electrolytic tinning line at Trostre Works



Tinned strip entering the cutting and classification section of an electrolytic tinning line



Strip entering the looping pit of the pickle line at Trostre Works

ENQUIRIES for Tinplate and Blackplate products to:

The Sales Manager, Carmarthen Road, Swansea, Glamorgan.

The exit end of one of the latest electrolytic tinning lines at Velindre Works

Two heads are better than one . . . so send that flavouring problem to the

BOEHM EXPERIMENTAL KITCHEN

As acknowledged experts in the field of food flavouring it is possible that we have the answer to your immediate flavouring problem. If not, the Boehm Experimental Kitchen will get to grips with it and do its best to find a solution. This service is absolutely free and, needless to add, is becoming more and more popular with manufacturers. Incidentally, many products today owe a great deal to the shrewd advice and technical help of Fredk. Boehm Ltd. Why not put your problem in the post to them NOW?

FREDK. BOEHM LTD., 19 BENTINCK STREET, W.1 Telephone WELbeck 7933

FREDK. BOEHM LTD.,
CONTINUES TO SUPPLY

AJI-NO-MOTO
Mono-sodium glutamate 99% pure.

YEATEX
Autolysed Yeast Extract.

PROTEX
Hydrolised Protein.

Why Discriminating Buyers Prefer

U·M·P

For Tubes and Plastics

The comprehensive U.M.P. SERVICE includes:-

A full range of tube closures, compression and injection moulded, wadded and wadless. The U.M.P. patented wadless closure is finding universal approval.

A competent Research Department and customers' Advisory Service.

The newest and most efficient protective lacquers, seals and finishes. "Weltex" Seal and "Decora" Shoulders have become "household" words in the Industry.

Laboratory testing of customers' products without cost *before* a suitable tube (lacquered or unlacquered) is offered. During production tubes are under continuous test to ensure faultless workmanship, correct materials, enamels, inks, etc., for all climates and temperatures.

A Design Department available to prospective as well as existing customers.

Those who do not use tubes to-day may do so tomorrow

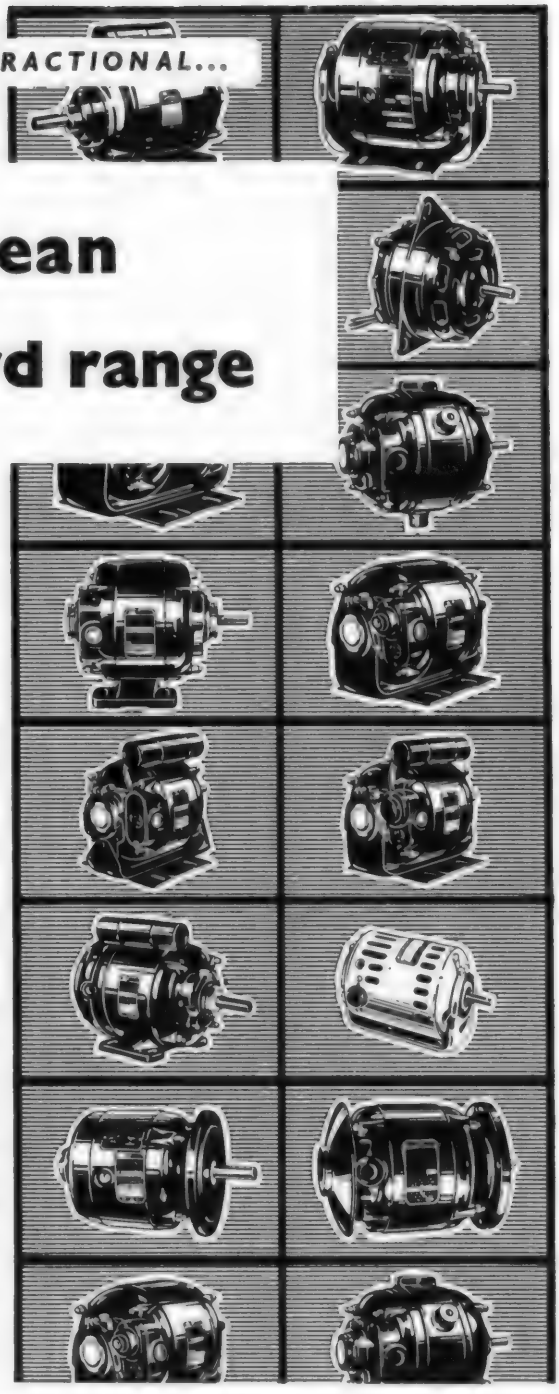
UNIVERSAL METAL PRODUCTS LTD.

SALFORD 6 LANCS. *Telephone:* PENDLETON 4444

LONDON OFFICE: ARGYLE HOUSE, 29/31, EUSTON ROAD, N.W.1. TEL. TERMINUS 2073

WHEN THE DRIVING POWER IS **FRACTIONAL...**

What we mean by a standard range



BTH fractional horse-power motors are made in a wide range—a wide range of mountings, a range of different enclosures and fittings, and a range of special-purpose types of which those illustrated form only a small selection. There is virtually a standard motor for any job. They are made in sizes from one-thousandth horse-power. There are base mountings or cradle mountings; spigot, resilient, ring or automatic tension mountings; horizontal, vertical and 'any-angle-you-want' mountings. There are AC motors, DC motors; geared units, auto-belt tension units; flame-proof or drip-proof enclosures; for high, low or medium speed applications at all standard voltages. Designers of machinery therefore have not only the widest field of choice but can take full advantage of standardisation and interchangeability.

A 'Fractional' Advisory Service For Designers

The long experience of BTH engineers with fractionals for all purposes is at the disposal of designers. Consultation at the drawing board stage can save you time and trouble. When you are planning new machines or modernising existing installations, get in touch with BTH.

B T-H

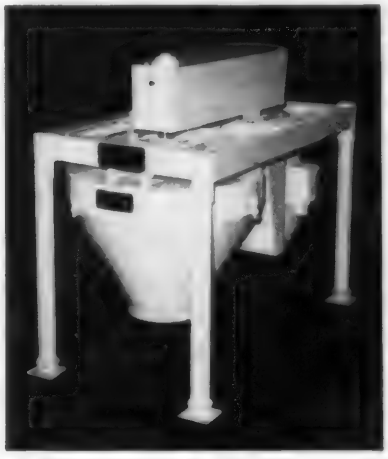
BRITISH THOMSON-HOUSTON

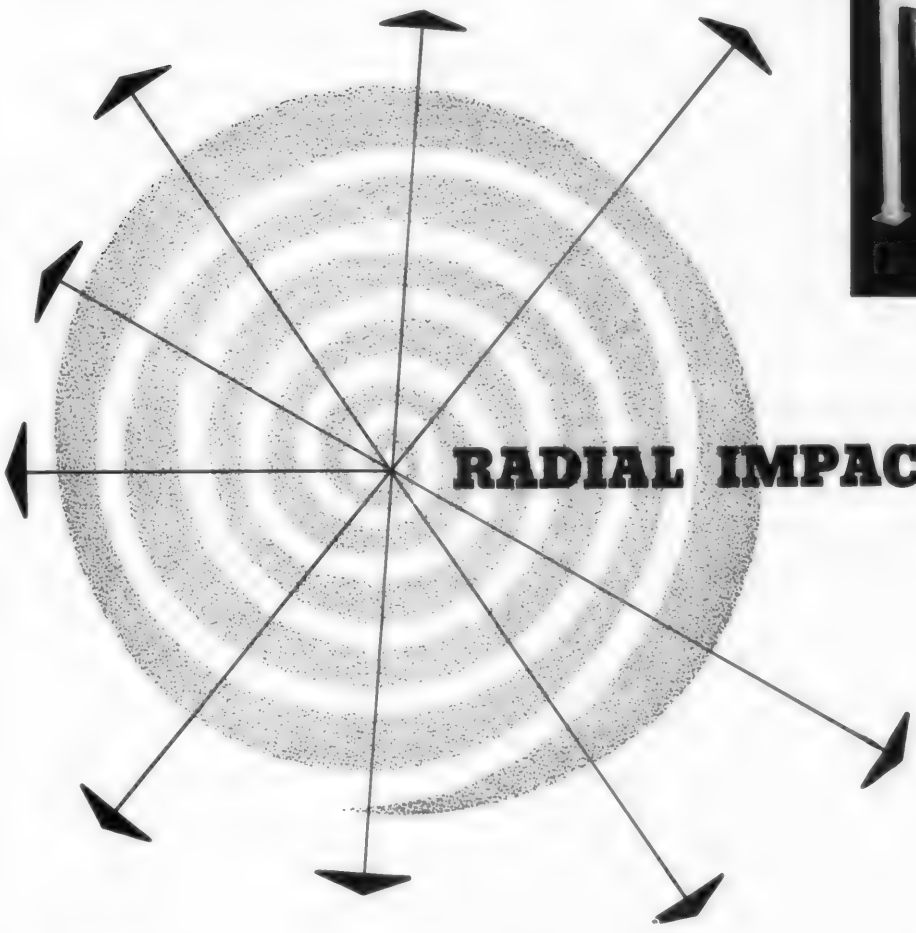
THE BRITISH THOMSON-HOUSTON CO. LTD., NEWCASTLE (STAFFS). ENGLAND

Member of the AEI group of companies

A3615

WHAT'S SO DIFFERENT ABOUT *THIS* MILL?





RADIAL IMPACT

the new way of grinding & pulverising

Particle size reduction through impact is the job of the Entoleter Impact Mill. The material is fed into the centre of a whirling rotor and is hurled radially against impactors which break down the particles with negligible friction.

The speed of rotation governs the degree of reduction and most powdered and granular materials can be ground accurately and without excessive temperature increase.

Capacities of the Entoleter Impact Mill range from 200 to 500 lbs per hour per h.p. and machines up to 40 h.p. are available.

Materials now handled include:

starches · sugars · flour · whey powder · liver meal · cotton seed husk salt · feeds · maize · meals · etc.

Tests willingly made on your own samples. Write today for details.

Entoleter Impact Mill by ***Henry Simon Ltd***

SIMON ENGINEERING GROUP

STOCKPORT, ENGLAND. TELEPHONE: GATLEY 3621 (16 LINES) TELEX No. 66-287

H.S.283/PS

FABLOTHENE

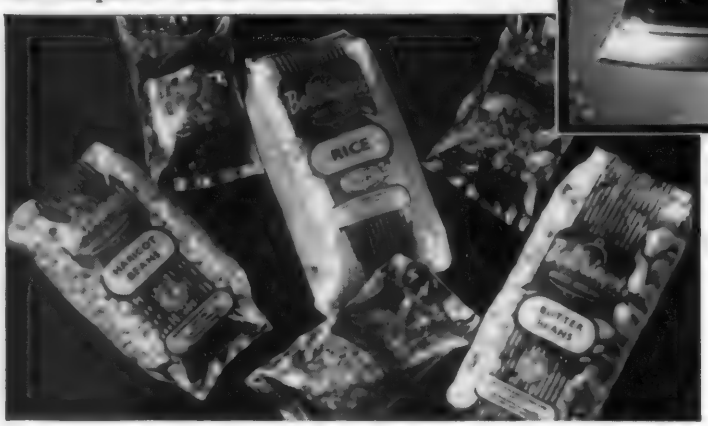
the packaging material with an infinite capacity for taking strains

No other packaging material has so many positive advantages as Fablothene, super-transparent, tear-resistant polythene that's ideal for packaging an almost limitless range of wet or dry goods either in bulk or as individual retail items. For Fablothene stands up to all the stresses and strains of storage and selling . . . it keeps *out* water, damp and dust . . . it keeps in flavour and freshness and it has an extremely low moisture-vapour transmission. What's more, Fablothene *shows* what it *preserves* . . . makes everything look fresh, appetising, irresistible! Fablothene bags open easily and can be used successfully in conjunction with automatic packaging systems.

TIME OR TEMPERATURE DON'T BOTHER FABLOTHENE. Fablothene is a single substance. It contains no toxic plasticizer, which after a time could migrate from the packaging to its contents, and in turn allow the polythene to become hard and brittle. Likewise, Fablothene remains flexible over a range of temperatures from −40°C to 100°C so it can be safely used for deep-frozen foods and export packaging. In the case of the latter, special heavy-quality Fablothene is manufactured for export and other circumstances where conditions are particularly rough.

CHEMICALLY RESISTANT. Fablothene is quite unaffected by dilute acids and only slightly by concentrated acids. It is also proof against fungi, salt and sea water and will not support mould growth.

FABLOTHENE CARRIES YOUR MESSAGE. We supply Fablothene ready-printed in up to four colours to a design supplied by you or our own studio. Ask to see specimens. They're outstanding! The Fablothene range includes layflat tubing, sheet film and bags in thicknesses from 120 gauge to 500 gauge. Layflat widths are from 2″ to 48″, with other widths and gauges produced to special order. **Before you decide on another packaging product, you must see samples of FABLOTHENE.**



Write or telephone for full details to:

ANGLO-AMERICAN PLASTICS LIMITED

1 Avery Row, Grosvenor Street, London, W.1.
Telephone: HYDe Park 9261

One of the CP Group of Companies

FABTHOLENE resists everything except the customers' attention

Stop Burning One in Ten!

Have a look at your power bill — and then consider your plant. Are you *sure* you are getting the most out of your transmission — or are inefficient drives frittering away the kilowatts which should be helping production?

As power costs increase efficiency matters more than ever — fit the only drive with a National Physical Laboratory Certificate confirming 98½% mechanical efficiency and get the power you pay for.

RENOLD high-efficiency drives cut your overheads

. . . Since 1947 electricity charges have almost doubled.
. . . Look at these figures from a typical factory :—

1947 £2·925 per 1,000 Units
1957 £4·9 per 1,000 Units

By making the most efficient use of power RENOLD CHAIN DRIVES are an effective counter to this cost spiral and can offset these and any future increases by as much as 10% — and go on doing so year after year.

RENOLD *—the FIRST name in precision chain*

RENOLD CHAIN LIMITED MANCHESTER

Left: An aluminium Storage Vessel

Butterfield craftsmen are called upon to turn out a wide variety of Stainless Steel, Mild Steel, and Nickel plant, Tanks, Vats, Vessels and so forth, to Plant Engineers' specifications for the storing, processing and refining of liquids for the Food Industry. This is important work for important jobs and Butterfield expert craftsmanship and attention to detail can be relied upon to produce extremely good results.

May we quote for your next job?

Butterfield

Storage & Processing Equipment

fabricated by experts in

STAINLESS STEEL

MILD STEEL
(*Jacketed*)

ALUMINIUM
AND NICKEL

Above: A row of
Stainless Steel pans for a series of tilting pans

Please mark all enquiries relating to this advertisement as follows: F M/2

W. P. Butterfield Ltd P.O. Box 38 Shipley Yorkshire Tel 52244 (8 lines)

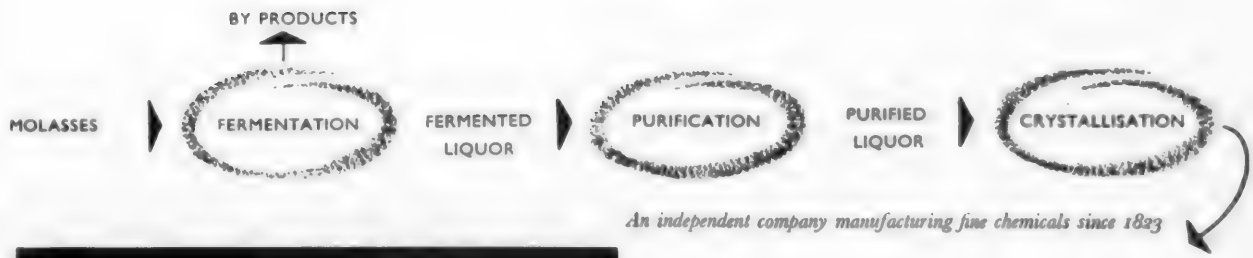
Branches: LONDON Tel HOLborn 2455 (4 lines) BIRMINGHAM Tel EAS 0871 & EAS 2241 BRISTOL Tel 27905 LIVERPOOL Tel Central 0829
MANCHESTER Tel Blackfriars 9417 NEWCASTLE-ON-TYNE Tel 23823 GLASGOW Tel 7696 BELFAST N.I. Tel 57343 DUBLIN Tel 73475 & 79745

FINE CITRIC ACID IN THE MAKING

Gardening in a test-tube

Our new artist's progress is retarded by his attitude. He sees himself as a sort of 'Unknown Industrial Prisoner' — a butterfly entangled in technology. Even a reminder that da Vinci was as happy with machines as with the Mona Lisa fails to cheer him. But we brought a glow to his cheeks recently by describing our mould cultivation process as "Gardening in a Test Tube".

We were referring to the spade work done by the industrial mycologist, who develops the most effective strains of microscopic plants for producing chemicals by fermentation. At Sturge, 25 million million spores of the mould Aspergillus Niger are grown every week in 5,000 test tubes. These spores are later sown in beet molasses to start the fermentation which converts it into citric acid.



An independent company manufacturing fine chemicals since 1823

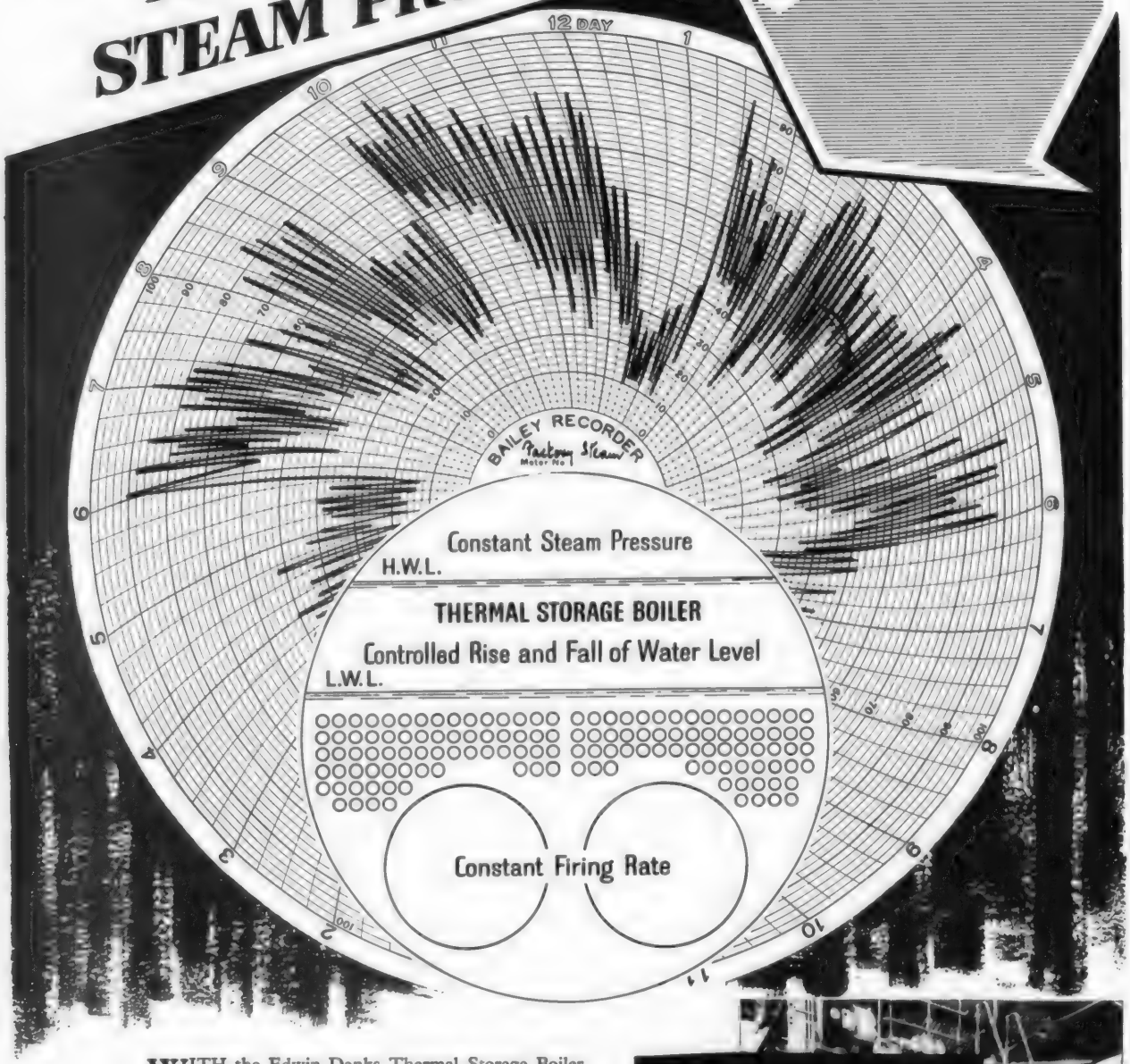
STURGE

CITRIC ACID B P

CITRIC ACID ANHYDROUS

JOHN & E. STURGE LTD., WHEELEYS ROAD, BIRMINGHAM, 15. TEL: MIDLAND 1236

IS THIS YOUR STEAM PROBLEM?



WITH the Edwin Danks Thermal Storage Boiler, wide fluctuations in steam demand can be met *without change in firing rate and without variation in steam pressure.* This saves fuel and improves factory output.

The first boiler of the type was installed by Edwin Danks in March 1956. Since then, thermal storage boilers have been brought into operation or are in process of installation in the following industries:— Food, Brewing, Dyeing, Woolcombing, Asbestos, Switch-gear, Cables and Printing.

If your steam problem is concerned with variable boiler load or fluctuating steam pressure, consult us at Oldbury or our nearest branch office.

FIRST of its KIND

EDWIN DANKS & CO. (OLDBURY) LTD

Oldbury near Birmingham. Tel. BROADWELL 2531 (9 lines)

LONDON · CARDIFF · MANCHESTER · LEEDS · NEWCASTLE · GLASGOW

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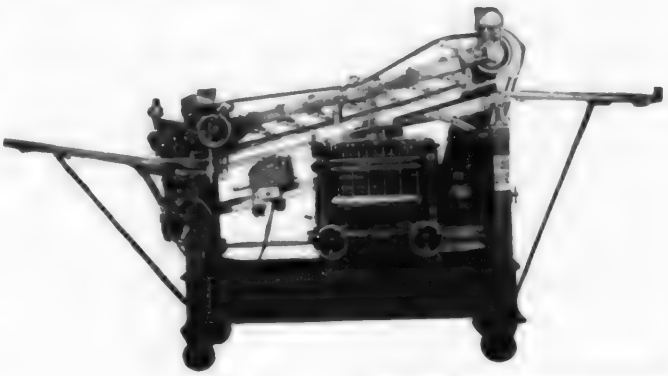

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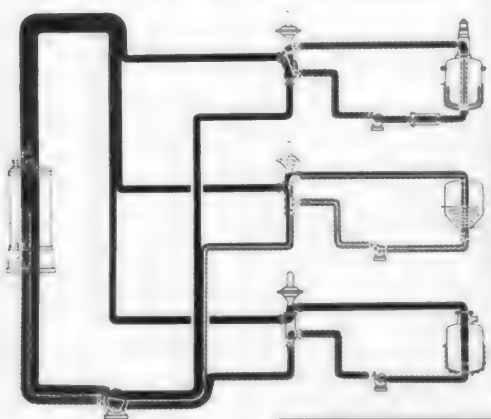

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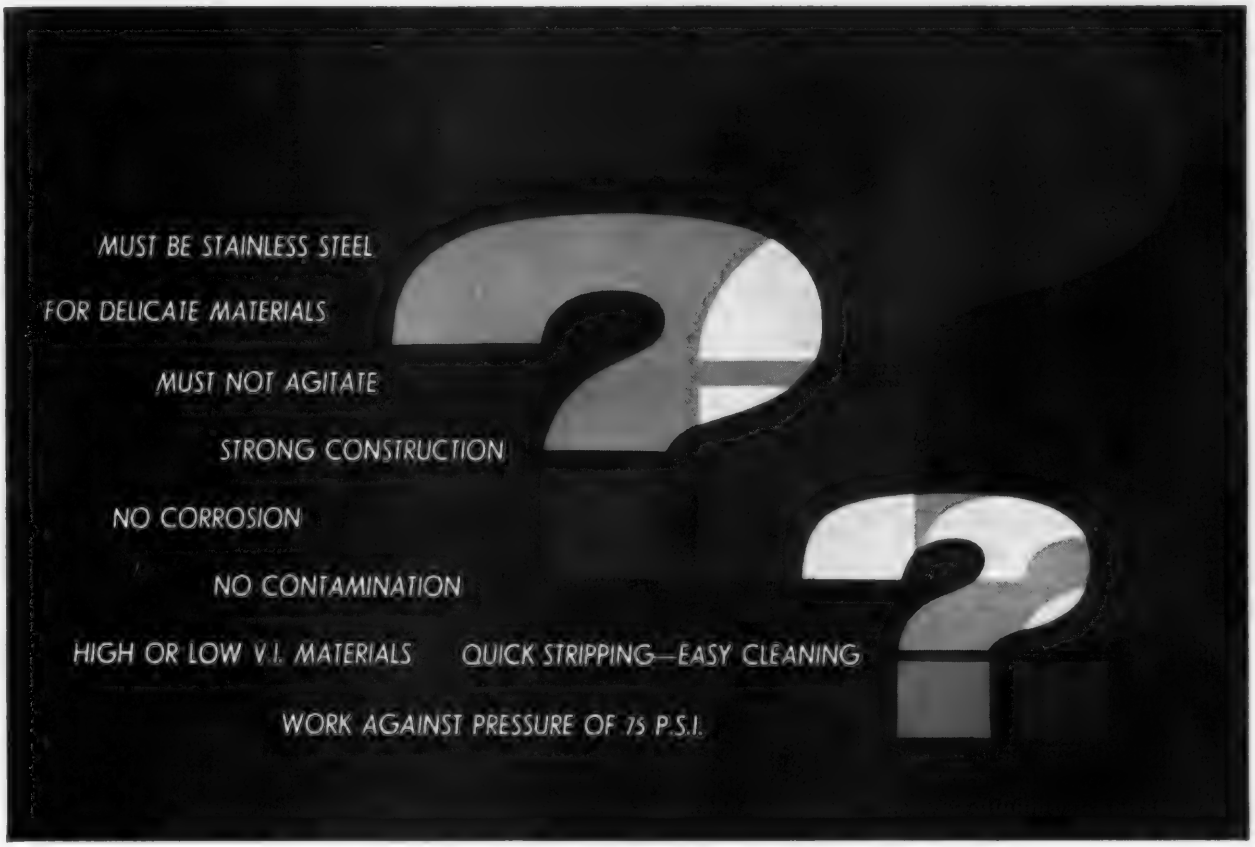

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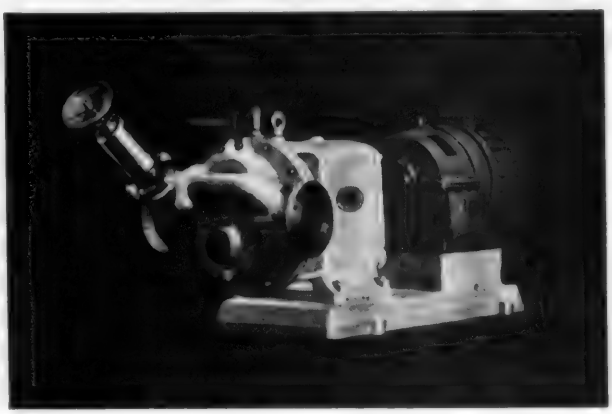

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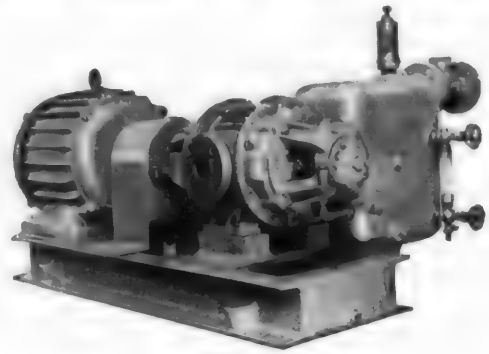

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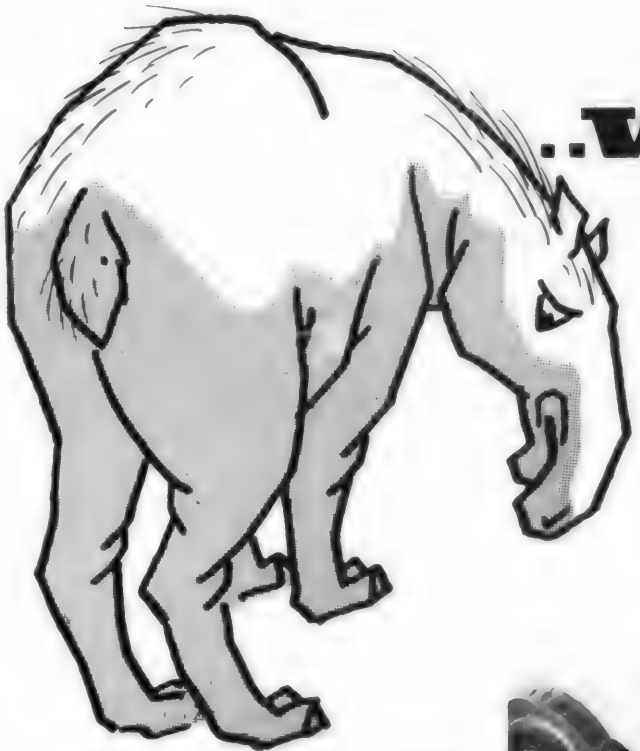

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P.1.

FOOD MANUFACTURE

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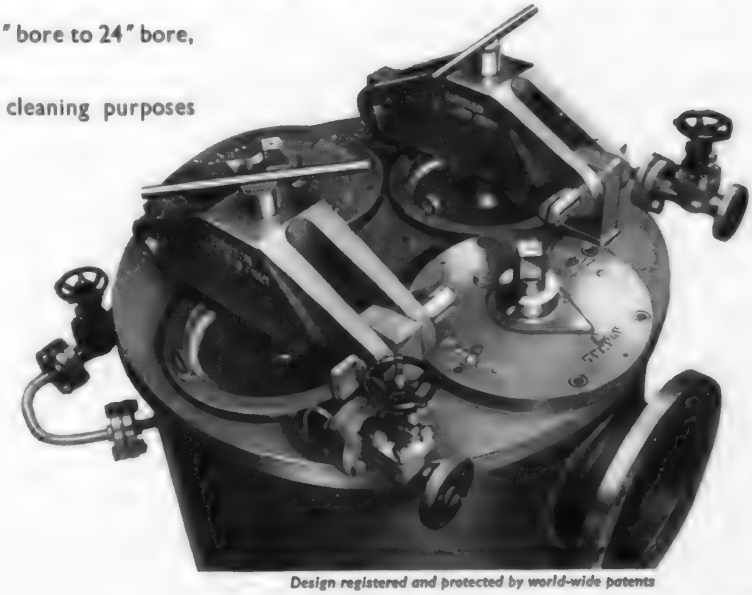

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FOOD MANUFACTURE

Vol. XXXIII, No. 2 February 1, 1958

Canning and quick-freezing

ALTHOUGH many of the crops which will be canned and frozen in the coming season have not yet been sown, thoughts are already turning to the handling of the 1958 harvest, and in this issue we present a review of developments in the canning and quick-freezing industries.

Important advances continue to be made in both these branches of food manufacture, and the relative positions they will ultimately come to hold in the food industry still forms a fascinating subject for speculation. The quick-freezing industry in particular has expanded extremely rapidly during recent years, despite several inherent economic handicaps. The industry is faced, for instance, with high capital charges, not only on the production but also on the distribution side, and in the latter respect it appears that it will always suffer from this drawback in comparison with canning. Another difficulty facing the industry is the relative difficulty of disposing in a reasonably economic way of second grade material, of which a certain amount must always exist. The war years left the British housewife with a marked prejudice against anything "frozen," and the quick-freezing industry has had to go to some lengths to break down this prejudice. It has done so only by maintaining an extremely high quality standard, and any attempt to cut prices or dispose of culls by the introduction of second grade products would prove disastrous to the industry.

On the other hand, it has been maintained that the processing required to preserve a canned product at room temperatures must always be destructive of the finer qualities of flavour and texture, and that storage at room temperature will always involve a slow deterioration in these qualities, processing notwithstanding. On the latter subject, there has been interesting speculation lately about the possible regeneration of destructive enzymes in canned goods, and their effects during room-temperature storage. The supporters of quick-freezing therefore maintain that the extra costs of this method of preservation will always be offset by the higher ultimate quality which can be achieved.

It is no part of our function to take sides one way or the other in such controversies. The housewife is becoming increasingly discriminating, and both the canning and quick-freezing industries have responded to this challenge by producing quality products which are a credit to the whole British food industry. We hope that the coming season, climatically and in every other way, will prove successful for both industries.

The lure of the dollar

THERE have been one or two opportunities in recent weeks to assess the possibilities for further expansion by the British food manufacturing industry in the dollar markets of North America. Late in December the Canadian Trade Mission left after its tour of this country, and an opportunity was given to the press to question members about their impressions. When questioned about the possibilities for the sale of British foodstuffs in Canada, various members of the delegation were quick to point out that as well as having an abundance of many of the staple foods, Canada has a well-integrated food processing industry of her own. The opportunities for all but a very limited range of speciality lines were not, therefore, great.

On the other hand, this well-developed food industry creates a demand for processing equipment, and members of the delegation were more sanguine about the chances of our increasing our exports to Canada of food processing machinery.

Another, and in some ways more hopeful picture of the North American market for British foodstuffs, was given by Mr. Kirk Lawton, managing director of Caxton's. Speaking about the chances of success for British sugar confectioners in the dollar markets, he laid great stress on the importance of having something new to offer, and of offering a product which was the result of genuine craftsmanship. It was quite futile, he said, for a British manufacturer to attempt to compete with the Americans in their own mass-produced lines, supported as they were by almost incessant advertising campaigns. What we must offer was something unprocurable from domestic manufacturers, something which would ap-

peal to a quality market and have the glamour of a foreign luxury product. Mr. Lawton felt that the market for this type of product definitely existed, and that although it was not an easy one to capture, it was well worth the while of a British manufacturer to pursue it.

From both sources it was emphatically maintained that in the face of modern American techniques of advertising, the best chance of success in entering the markets was for British firms to make and follow up personal contacts at the highest level. What we have to offer from this country is apparently a frequent source of amazement to the Americans and Canadians—when we tell them about it. Telling them about it at the highest level would appear to be one of the surest ways of getting into the markets.

Beta-carotene by fermentation

A NEW microbiological fermentation process for producing *beta*-carotene or pro-vitamin A is well on the way towards successful development at the Northern Regional Research Laboratory (Peoria) of the U.S. Department of Agriculture. The process utilises the earlier U.S.D.A. research discovery that mating strains of micro-organisms can lead to better fermentation yields. Growing together different strains of the mould *Choanephora cucurbitarum* and some members of the *Choanephoracea* family has led to yields of *beta*-carotene greatly exceeding the concentrations found in normal plant materials.

At Peoria solutions made by treating pulverised cereals with acids have been used as the raw material for aerated fermentation. The period of fermentation is said to be "several days." The carotene synthesised by the mated organisms accumulates in their cells and filtration easily isolates this source of the pro-vitamin. The filter cake obtained is bright orange in colour, and it is said that it may contain as much as 0·5% of *beta*-carotene. It can be ground to powder for use as a direct additive to animal feeds, or it may be extracted to produce pure *beta*-carotene. Any doubt whether the pro-vitamin produced by fermentation is less biologically available has already been removed by bioassay testing.

How far present methods for producing *beta*-carotene—extraction from plant material or by chemical synthesis—will be affected remains to be seen. There is, of course, a multi-purpose market. *Beta*-carotene is ever more widely used as a vitamin additive to animal and poultry feeds, and it is also used to provide desirable colour in a variety of food products. The tendency for fermentation process costs to decline as the scale of manufacture increases may well favour the commercial development of the new method.

Noise in the food plant

ALTHOUGH it cannot be calculated in terms of hard cash, investigations have proved that the cost to the nation of noise should not be underestimated. An enquiry into the subject reported in *Target* shows that faulty work, loss of time and materials, accidents and even loss of hearing among the workers may occur as a result of excessive noise.

As is pointed out in the report, it is not possible for management to pick out the worker who may be unduly sensitive to noise at the interview preceding his or her employment. There is a tremendous amount which can be done, however, to reduce the amount of noise in the machines themselves, although this must be largely the job of the original designer.

An example of management playing its part in this question is provided by Petfoods, Ltd., who use a conveyor 24 hr. a day carrying empty cans from the reception to the processing and canning departments. The cans are delivered in bulk containers, from which they are unloaded into gravity chutes leading to a band conveyor; they then travel by means of an elevator to a gravity track feeding the main conveyor. For the first part of its length the conveyor is housed in a tunnel of asbestos supported by a steel frame, which runs along the outside wall of the granary. It then runs through the packing and labelling departments before reaching the processing department. Overfeeding of the cans to maintain a constant supply was reported to have added to the already excessive noise arising from the conveyor.

Lining the floor of the covered-in section of the conveyor with asbestos board and glass wool reduced the noise to some extent, but it still remained sufficient to worry some of the workers. Quilted, asbestos-filled pads were therefore suspended from the tunnel roof and these made a further reduction in sound. Noise along the open section of the conveyor, which affected workers in the labelling, packing, processing, and canning departments, was reduced by boxing in a 56 ft. length of the conveyor at the top and sides with sound-proof panelling. A half-box baffle of suitable boarding was used on a section of the conveyor troubling quality control inspectors.

The main office of the factory has also been planned with the subject of noise-reduction in mind. The whole floor is carpeted, and a 6 ft. horizontal strip of sound-proof tiling runs along the middle of one wall. The ceiling is also constructed of sound-proof tiles.

Petfoods do not claim to have eliminated the noise within their plant but rather to have reduced uncomfortable peaks to within satisfactory limits.

Glycerine for cooking

ONE of the papers read at the last national meeting of the American Chemical Society sprang from a 14-years-old girl's kitchen experiments. Trying to cut down on the time she spent in cooking meals for her father and young brother, she found that adding glycerine to water in which foods were cooked reduced normal cooking times by as much 50%. Her father, a U.S. Government chemist, and another scientist, shared in the further development work. The usual addition was of about 60% by weight of glycerine to the water; large time-savings were claimed for various methods of cooking eggs—hard boiling, scrambling, and poaching—for double-boiling cereals, pressure cooking potatoes, and boiling prunes.

It was also suggested that the glycerine-water method could replace fats and oils in many frying operations. If the use of fats and oils for frying is looked upon wholly as enabling higher temperatures to be achieved than those possible with water, then adding glycerine to water can do this with the advantage that only a very small amount of the glycerine vaporises from the water. For many cooking operations the added glycerine would not in fact make direct contact with the foods; for some, as in direct immersion boiling (*e.g.*, prunes) there is contact, and then it is claimed that the glycerine added a sweet and desirable flavour.

Good food, good health

A FURTHER appeal has been made for the choice of more balanced diets as a means towards improving individual and national health. Discussing the relationship between diet and the enjoyment of good health—a subject which has recently received a good deal of attention in the medical world—Dr. H. M. Sinclair, Vice-President of Magdalen College, Oxford, has drawn attention to the very great increase during recent decades in what are generally classified as degenerative diseases. Such diseases include cancer of the lung, coronary thrombosis, and peptic ulcer, which have all increased alarmingly during the present century, despite the remarkable advances in the treatment of many other types of disease. Indeed, the increase of these degenerative diseases has been such that despite the considerably greater expectation of life which a child now enjoys at birth (owing largely to the decrease brought about in infant mortality), the expectation of life for a middle-aged man is hardly different to what it was a century ago.

A good deal of evidence is accumulating that many of these diseases are caused, or at least greatly aggravated, by faulty dietary patterns. Dr. Sinclair stressed the importance of the essential fatty acids in the maintenance of correct tissue functioning, and of vitamin B_6 and vitamin E in the metabolism of these essential fatty acids. He pointed, indeed, to this trinity of vitamins—the essential fatty acids themselves being considered as a single vitamin in this respect—as being of prime importance in the healthy functioning of connective tissue, and suggested that a deficiency of them was responsible for many diseases, including duodenal ulcers, coronary thrombosis, and even carcinoma of the lung.

Turning to the dietary sources of these vitamins, Dr. Sinclair maintained that almost every increase in the sophistication of our diet tends to decrease our supplies of them. He pointed out that the fats of the ox and the sheep are naturally deficient in the essential fatty acids, and that the practice of feeding stable concentrates for the production of prime beef and mutton decreases the amounts present still further. Such fats as do contain the highly unsaturated essential fatty acids in appreciable quantities are naturally soft, unstable and prone to rancidity, and in our efforts to harden them and improve their keeping power by hydrogenation, large amounts of these vital substances are destroyed.

On the subject of vitamin B_6, Dr. Sinclair drew attention to the fact that modern levels of extraction in flour milling result in our rejecting much of the vitamin from what was at one time our most important source of it; and the "improvers" we add to our flour, he said, destroy most of the vitamin E, as well as the essential fatty acids which we would otherwise get from this source.

It might seem from this apparent tirade that Dr. Sinclair was the sworn enemy of all types of food processing; but this is not the case. In fact he pays tribute "to the high standard of the food manufacturers, who have a laudable sense of responsibility." His plea is rather for more money, time and effort to be spent on research into the effects which various processing techniques have upon food, and the effects which various constituents of the foods, whether they occur naturally, are deliberately added, or arise as artifacts during the processing operations, have upon the body.

Badly needed research

On the financial side, Dr. Sinclair gives some cogent reasons to illustrate his point that further research is urgently needed. He points to the recent changes announced in the Welfare foods, and suggests that a little research work would have shown long ago that the need for vitamin D and vitamin C were not what they were originally thought to be; research work which could have been done for a fraction of the cost of the Welfare foods and vitamin additions which have now been shown to be un-

necessary. As further evidence on this subject, Dr. Sinclair points to the cost of the dental service, and suggests that a little more research on the cause of dental caries—another disease of civilised countries, with probable dietary causes—might do more than anything to reduce the enormous outlay which this service entails.

It is a sobering thought for anyone approaching his middle years that despite all the advances in medical science his expectation of life is no greater than that of his great-great-grandfather. If many of the diseases which have increased during the last century are in fact dietary in origin, then the need for extra research into the effects of food in and on the human body is clearly great. In the meantime, the choice of a well-balanced diet would appear to be the best possible safeguard for the average man.

As for the relationship of food processing to these dietary deficiencies, it will be interesting to see the effect of the use of anti-oxidants in fatty foods, for which food manufacturers fought hard for many years. One cannot see how they can fail to have a very marked protective action on the essential fatty acids and vitamin E of fatty foods, and to increase our intake of them accordingly.

Dr. Sinclair's comments appear in a recent issue of the *British Medical Journal*.

Herring industry decline

LAST year was probably the most critical the Scottish herring industry has faced in its long history. Numerically, the industry has already shrunk to perhaps one-third its pre-war size, and in spite of the Government subsidy, introduced last May, there appears little immediate hope that the decline can be arrested.

Wick has perhaps the most dramatic tale of decline. Less than 100 years ago the harbour was filled with herring boats. Last year only two "strangers" used the port—and that only for one week. There were no local boats. From Peterborough, Fraserborough, and many other ports, come reports of similar if less drastic reductions in the number of boats in operation.

The East Anglian season—October and November—has for long been virtually a Scottish monopoly. Before the war it brought almost a mass exodus from the Aberdeenshire fishing ports, more firms than not sending down their workers by special train. Nowadays it would probably be true to say that one or two special trains would be enough for everyone.

There is a variety of reasons for the decline, some of them obvious and some not so obvious. One obvious enough is that boats are now extremely expensive—£17,000 and more as against £7,000-£8,000 a few years ago, and only a fraction of that before the war.

Costs of that sort, especially when the high costs of nets and all the other infinity of gear are added on, are not all easy for the family type fishing—traditional in Scotland—to absorb. The lack of subsidy for herring fishermen has previously tended to drive them to "white" fishing, where there was a subsidy, though the Government hope that the direct subsidy now granted to the herring industry will succeed in reversing this trend.

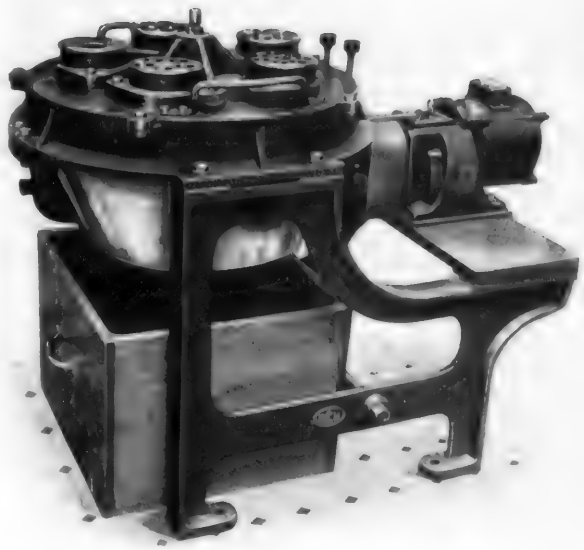
Earnings

Another very relevant factor, however, is that deck hands—who form three-quarters of the boats' crews—can earn more ashore than they can at sea, and that without the extreme rigours of the sea-going life and the long periods away from home that it necessitates. It has been estimated that the average deckhand has probably not earned more than £9 per week during the past summer, and one can hardly blame these men—especially those who are not bound to the sea as a way of life—if they choose the relative comfort and safety of a job ashore, especially if this is in addition going to prove more lucrative.

What appears to be the crowning blow to the industry, however, is the disappearance of the herrings themselves. Not all have gone, of course, but the 4-year-old fish, which have been a prized part of the East Anglian season, have now become extremely scarce. Catches have been very poor, and the boats have been operating on an increasingly uneconomic basis.

The reason for this is somewhat obscure. Many practical men in the industry, and some scientists, believe that foreign trawlers have cleaned out the North Sea nurseries. Other scientists say that it is impossible to over-fish herring, and that the explanation must be looked for elsewhere.

Whatever the cause of this disappearance of the fish, however, it adds up with the other factors discussed to the rather paradoxical situation of an industry which is for the moment in decline, being unable to meet the orders which are waiting to be fulfilled. If the decline is to be arrested, and the industry put once again on a buoyant footing, it would appear that drastic action is necessary. There is already talk of closing the English Channel to fishing, to prevent boats from chasing herring down the Channel as they work round from the East Coast to the North Sea spawning banks, but this alone can hardly solve the problem. A real drive on the part of scientists in the industry to find the cause of the disappearance of the fish, coupled with some form of international agreement on the extent of fishing to be allowed, would seem to be essential.



Vegetable slicing machine made by Brierley, Collier and Hartley, Ltd.

A continuous "goose-neck" elevator made by Fredk. Braby and Co., Ltd.

CANNING EQUIPMENT

A "Food Manufacture" Survey

Can-making machinery

THE canning process begins, in one sense, with the fabrication of the can.

A well-known range of can-making equipment is made by E. W. Bliss (England), Ltd., including a number of semi-automatic double seamers. One of the simplest of these is the 712A seamer for cylindrical containers. This will handle cans of from $1\frac{1}{4}$ to 6 in. in diameter and from $\frac{3}{4}$ to 10 in. in height. The machine is hand fed and actuated by a pedal. Operation speeds of up to 35 cans per min. can be achieved depending on the size of the can, the can contents, and the skill of the operator.

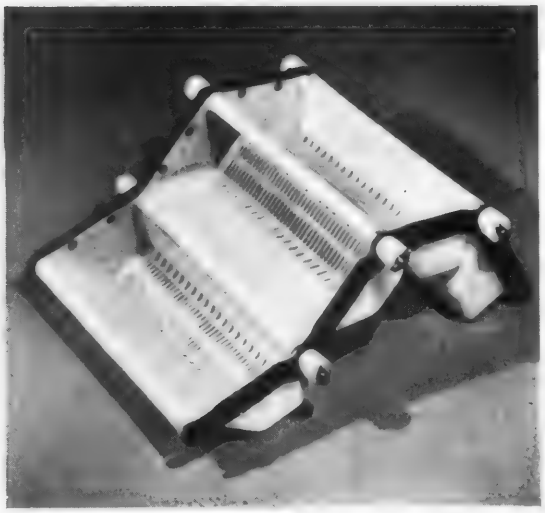
The *Bliss* No. 714A is a similar model handling square, oval and irregular shaped containers at production speeds of from 10 to 20 cans per min. Cans from $\frac{3}{4}$ to 10 in. high, and from $1\frac{3}{4}$ to 6 in. across the corners can be handled, provided that the maximum variation between the major and minor axes of non-cylindrical cans is not greater than $2\frac{1}{2}$ in.

The *Bliss* 12A and 12B seamers are also semi-automatic machines for double-seaming round cans. These machines can be obtained with a hand-feed, foot-operation mechanism similar to that of the machines just described. In addition, the 12A and 12B seamers can be obtained in a modified form with a body feed attachment. This enables the cans to be fed on to a chain conveyor, from which they are fed to the seamer automatically. The only hand operation then remaining is the placing of lids on the cans, and this becomes the limiting factor in operating speed. It is claimed that speeds as high as 60 per min. can be achieved. A curling attachment, suitable for use with slip cover cans, is also available. This enables two operations to be performed at once—the double seaming on of the bottom and the false wiring or curling of the top of the body.

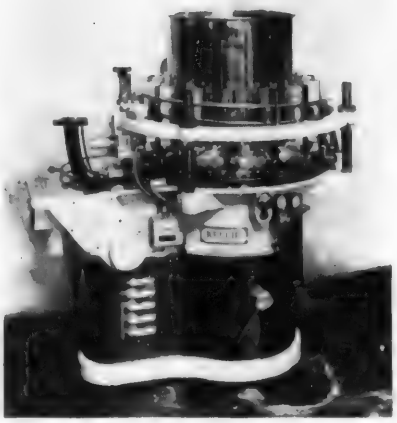
Other semi-automatic seaming machines made by the same firm include the *Bliss* Nos. 15, 16B, 17, and 18, all of which are designed for handling non-cylindrical cans. The *Bliss-Pacific* is a fully-automatic double seamer which will handle filled cans at the rate of 80 to 160 cans per min. In the can shop the machine will operate at speeds of from 150 to 200 cans per min. It is constructed on a double turret principle, and packing-house models are equipped with friction dial feed and can timing mechanisms. Non-spill feeding devices and coding devices can also be fitted.

There is also available a complete range of *Bliss* machinery for fabricating cans, including gang slitters, scroll shears, body makers, flangers, cover presses and other necessary machinery for the can shop.

Pearson Panke, Ltd., handle Schuler can-making equipment. One of the latest Schuler introductions is a body maker capable of producing 500 cans per min. Further details of this machine have not yet been released for publication. The *Schuler* AZ 115$_b$ body maker, which links up with the VL115$_b$ soldering unit, is designed to produce 300 cans per min. Can diameters of from 2 to $4\frac{1}{2}$ in., and heights of up to 6 in., can be handled. Schuler also manufacture a wide range of other can-making equipment, including



Cascelloid standard-size conveyor buckets made in heat-resistant polythene.



A 14-head rotary piston type filler, for liquid and semi-liquid products, made by Robert Kellie and Son, Ltd.

shears, lid makers, double seamers and can testers. Complete automatic and semi-automatic lines can be installed for the fabrication of all types of can, including extruded aluminium cans of various shapes and sizes. The semi-automatic machines are of special interest to the smaller manufacturer whose operation is not large enough to permit the economic employment of a fully automatic line.

Pearson Planke, Ltd., are also agents for J. G. Mailaender, a German firm manufacturing tinplate coating and varnishing machines and tin printing presses. The *Ultra-Remus* is a fully automatic machine for plain lacquering and for stencil varnishing and spot coating untrimmed sheets of tinplate at a rate of 5,500 sheets per hr. It has a synchronised feed for use in conjunction with a mechanical drying oven.

The *Superblerota*, made by the same firm, is a three-colour offset rotary tin printing press, capable of handling up to 5,000 sheets per hr. By the use of a more powerful motor, this machine may be coupled up with the *Ultra-Remus* varnishing machine previously described. The sheets of tinplate can then be successively printed and lacquered.

Product preparation

In another sense, canning begins with the preliminary preparation of the product. Where vegetables are handled, these preliminary steps usually include washing and blanching, and peeling, slicing and dicing equipment may also be employed. In the specialised case of peas, viners are also necessary, whilst certain fruits such as black and red currants have to be cleaned of adhering stalks; gooseberries require topping and tailing. Machines are available for all these purposes.

Frederick C. Kane, Ltd., are now manufacturing an all metal pea viner said to have a new type of beater drum assembly. The machine also has a longer and wider riddle drum and wider feed elevator and straw carrier. Timkin roller bearings are fitted on the beater shaft and drums, and stub shafts are renewable. The machine is built on a heavy steel frame and supplied with or without a variable speed drive.

A dry cleaner or winnower is made by the same firm. The product is fed through the feed opening into a rotating feed turret which discharges across an upward stream of air. This removes all light trash, the product passing to the perforated cleaning drum, which is kept permanently clean by means of a rotating brush.

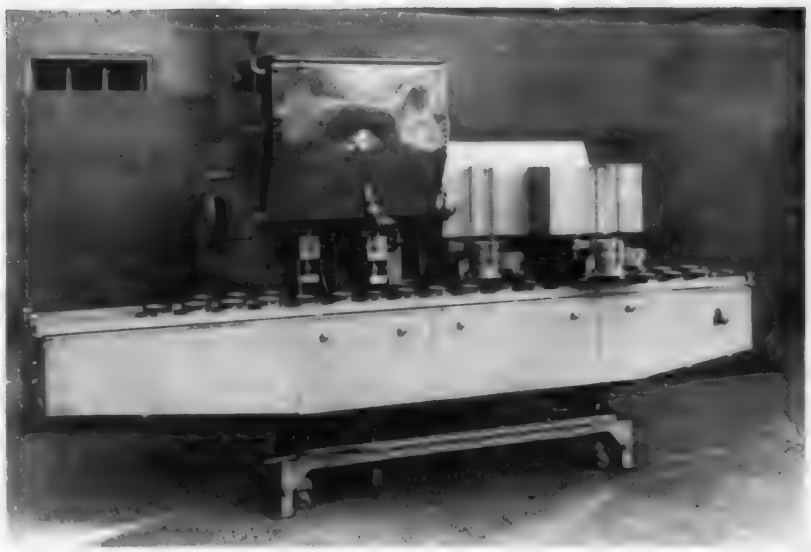
A black and red currant picking machine, intended for the rapid removal of the currants from adhering stalks, is made by Brierley, Collier and Hartley, Ltd. The machine consists essentially of an inclined reciprocating screen through the interstices of which mechanical fingers rotate at the rate of 200,000 per min. The currants are fed on to the higher end of the screen and are freed from the stalks by the gentle tapping of the rotary fingers. The stalks, freed from the fruit, fall to the screen and are immediately drawn through by the revolving fingers into a receptacle below, while the fruit rolls away and is carried by the rotary fingers down the inclined screen into another receptacle. Loss of fruit through pulping is said to be very low, being less than 4% on fruit of average ripeness and quality, and fruit of this type can be picked at the rate of 5 to 7 cwt. per hr.

Washing machines

A straight-through flotation washer for peas is made by Frederick C. Kane, Ltd. Improvements incorporated in this machine are reported to include direct pump suction, increased pump capacity, separate drives for pump and reel. Reel and pump filters are standard fittings in the main water tank. The machine also includes a wedge wire self-cleaning drum. All water pipes are centrally controlled.

Fruit and berry washing machines are produced by Robert Kellie and Son, Ltd. Their *Kellie*

continuous washer is suitable for handling strawberries, raspberries, red and black currants, cherries, plums, apples, etc. The fruit is hopper charged and spread evenly over the transporting belt by means of a regulating gate. The inclined travelling belt carries the fruit forward in a thin, single layer, the water bath being gently agitated by a rotating paddle which forces the water in a pulsating motion up and down through the belt, so that each berry receives a thorough washing. Immediately the fruit leaves the water bath it passes under a series of sprays, which are converted by wire screens into a fine, dense mist, preventing injury to tender or fully ripe fruit. Sand, leaves, dirt, etc., settle on the bottom of the tank at the lowest end, and are easily discharged by draining the tank.



Straight line conveyor type volumetric filler by Ganzhorn and Stirn, marketed by Ideal Packagings, Ltd.

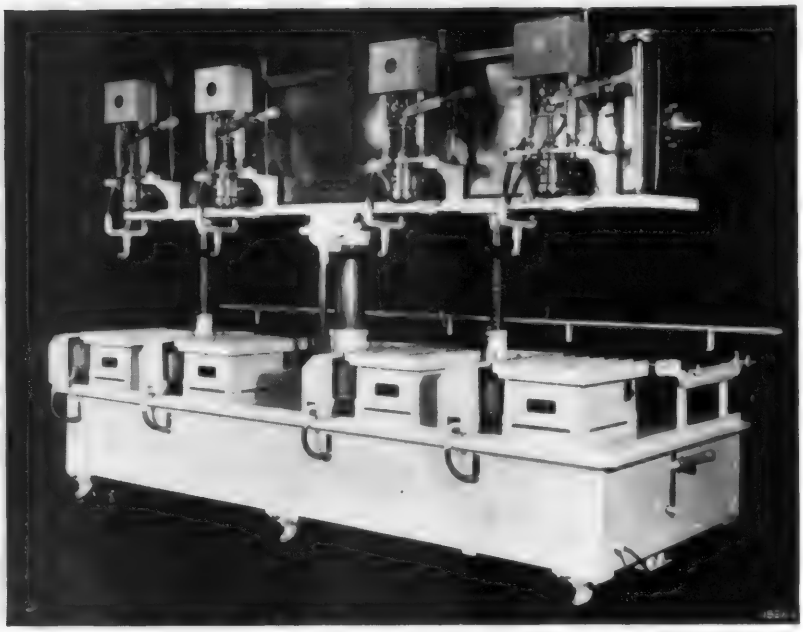
Peeling and cutting machines

A vegetable dicing machine is manufactured by the same firm. The *Kellie* Type V.A. dicer is usually equipped with one $\frac{3}{8}$ in. die-plate and one slicing knife. An automatic vibrating screen, designed to separate the complete cubes from the smaller pieces, can also be fitted. Without the die-plate the machine can be used for slicing beetroots.

Peeling, dicing, slicing and pulping machines are also manufactured by Brierley, Collier and Hartley, Ltd. Their latest continuous vegetable peeler consists of 4 compartments, each of which contains 4 steel rollers covered with carborundum. These rollers revolve in the same direction at a high speed. The 4 rollers in each compartment are divided into pairs, each pair having a separate rocking motion which turns the vegetables over and over as they pass through the machine. The vegetables are fed into the machine either batchwise or from a continuous feed belt, and they are conveyed through the machine by the action of the rollers. The flow of vegetables from compartment to compartment is controlled by adjustable shutters, so that peeling can be regulated and under- or over-peeling eliminated. Each compartment has a water spray which ensures that the peeled vegetables are clean when delivered. Output rates of 2 tons per hr. on potatoes and $1\frac{1}{2}$ to 2 tons per hr. on carrots can be achieved.

A 15-ft. stainless steel rotary blancher made by Frederick C. Kane, Ltd.

The same firm also makes a dicing or cubing machine, which can also be used for slicing, and the vegetable slicing machine with multiple feed hoppers which is illustrated. The latter machine will slice blanched or raw carrots, turnips, parsnips, beets, rhubarb, etc., as quickly as they can be dropped into the holes in the feed boxes. The machine can be set to cut any thickness of slice from



The 4-Head Multi-Avant filler for synthetic cream and similar liquids. Filling is by gravity, weight operated and electrically controlled.

$\frac{1}{8}$ to 1 in. thick, the standard size being $\frac{3}{16}$ in. The cutting disc and feed boxes are made from gun-metal, and the cutting knives and delivery shoot from stainless steel. The machine is fitted with 5 feed boxes, the holes in which may vary in size. Changes from one size to another can rapidly be made. With two operators feeding the machine, an output rate of 6 cwt. per hr. can be ahieved.

Another interesting machine made by Brierley, Collier and Hartley is an apple peeling and coring machine, which will handle 25 to 30 fruits per min. The firm also make a bean and celery cutting machine, designed for cutting French and runner beans, celery, rhubarb, macaroni strips, noodles, wet fish fillets, etc. A diamond-shaped cut may be achieved by placing the units diagonally on the feed belt. Pulping and sieving machines for the preparation of fruit and vegetable purées, seedless jams and jellies, etc., are also manufactured.

Blanching

The blanching process is another important preliminary in many forms of canning, and a variety of blanchers are manufactured. Continuous apparatus is tending to displace batch apparatus for this purpose, and several firms are now marketing continuous-action blanchers. Robert Kellie and Son, Ltd., make a rotary blancher of this type, the *Kellie* Type BB which is equipped with a re-washer and gooseneck elevator. The blancher also has an infinitely variable speed gear, and blanching times may be varied between 2 and 20 min. The re-washer is driven by a continuation of the blancher shaft and the elevator from the constant speed shaft of the variable speed gear, and only one 5 B.H.P. motor is required to drive the combined unit.

A blancher of the central shaft type is also produced by Frederick C. Kane, Ltd. The machine is constructed of stainless steel throughout, and the outside top half of the drum can be lifted by means of a hand winch. The inner drum is built with two quarter openings to allow easy access to all parts of the scroll. The machine incorporates a fully-enclosed variable speed drive, and is fully instrumented.

Rotary and belt-type blanchers are also made by Frederick Braby and Co., Ltd.

Conveyors

Conveyors of many types are used on various canning lines, and Frederick Braby and Co., Ltd., also make a range of conveyors in their comprehensive list of canning equipment.

A recent introduction is the use of plastics in the construction of bucket conveyors. The Cascelloid Division of British Xylonite, Ltd., have now produced an all plastic conveyor bucket from a special grade of heat-resistant polythene. When used with nylon straps and rollers, the bucket gives complete freedom from rust, and mould growth is also said to be prevented. Conveyors constructed in this way can be steam-sterilised and they are, of course, very much quieter in operation than metal conveyors. The buckets are designed to standard size, and can therefore be fitted to existing standard-size conveyors without modification. They are said to be competitive in price with metal buckets.

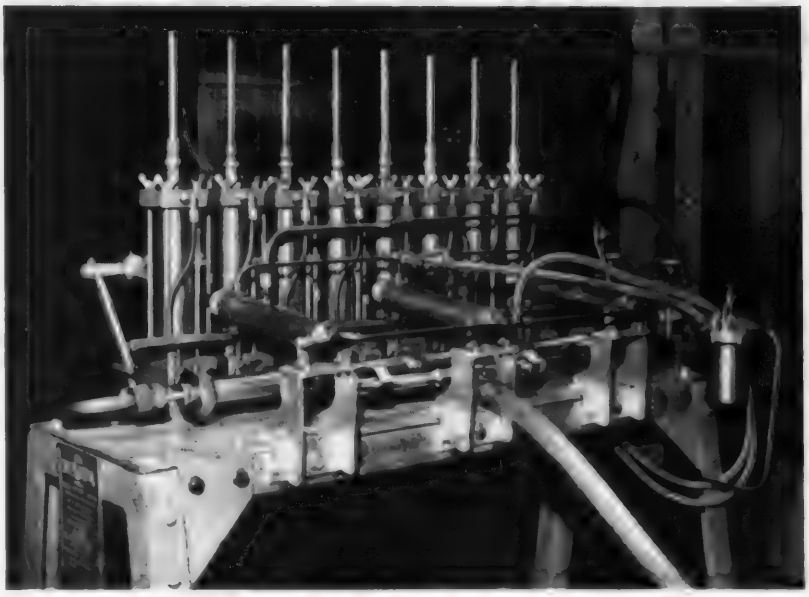
Fillers

When the preliminary can-forming process and the preparation of the product are complete, the two are brought together in some kind of filling device. There are many types of filler on the market, each with its own particular uses. Volumetric filling machines made by the German firm of Ganzhorn and Stirn are marketed by Ideal Packagings, Ltd. These are suitable for filling liquids and pastes, and range in size from a small bench-type model to a treble head machine for large outputs. The bench model is fed by hand, and the filled containers must also be removed manually. In a turntable model, the cans must be positioned by hand, but subsequent operations are automatic. A single head model is available for continuous operations, and the treble-head filler allows a maximum production rate of 1,200 units per hr. A considerable variation in volume of fill can be achieved with all the models, so that they are adaptable for use

with several sizes of can on different occasions. They have been used successfully for filling oils, fats, condensed milk, honey, salad cream, marmalade, jam, tomato purée, and several other food products.

Robert Kellie and Son, Ltd., also manufacture several types of filling unit. The *Kellie* Type 1FF is a 10-head automatic filling machine for peas and beans. The machine has a filling sequence—half the liquid, then the solids, then the remaining half of the liquid—which is said to prevent air-trapping or the overflow of liquid during the filling operation. It is equipped with a stainless steel rotating feed hopper, acid-resisting bronze measuring pockets, stainless steel brine tank, and a stainless-steel-topped delivery table. The main vertical centre shaft is also of stainless steel, and the drive is synchronised from the feed table of the double seamer with which the filler is linked. The standard machine is equipped to fill A2 and A2½ cans, but interchangeable parts can be supplied to enable the machine to fill 8 oz., A1, No. 1 tall, and E1 cans. A production rate of 180 cans per min. can be achieved.

The *Kellie* 11 FP is a high-speed automatic straight-line filling machine capable of speeds up to 240 containers per min. The machine is said to be very smooth and accurate in operation, free from spillage and troublesome aeration of the product, and the filling level is under the full control of the operator from the normal working position opposite the filling nozzles. The filler is extremely well instrumented, and the instruments and controls are conveniently grouped on a panel in front of the machine.



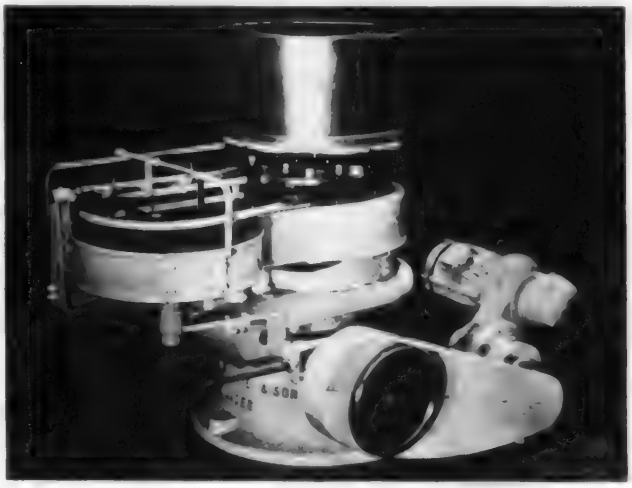
An 8-head array of Bexuda fillers for liquids and semi-solids.

Roberts Patent Filling Machine Co., Ltd., also make a range of filling machinery for various liquid food products. Their 4-*Head Multi-Avant* machine has been developed for filling synthetic cream and similar liquids. Filling is by gravity, weight operated and electrically controlled. All parts coming into contact with the product are made of stainless steel, and each machine is tested and stamped by the Weights and Measures inspector before leaving the factory.

Beer is now being marketed in cans in increasing amounts, and Meyer Liquid, Ltd., are marketing a filler for flat-topped beer cans. Known as the *Meyer-Dunmore* filler, this is a rotary multiple-head unit available in several sizes, capable of handling from 200 to over 600 cans per min. The filler may be linked to any type of seamer capable of equivalent speeds.

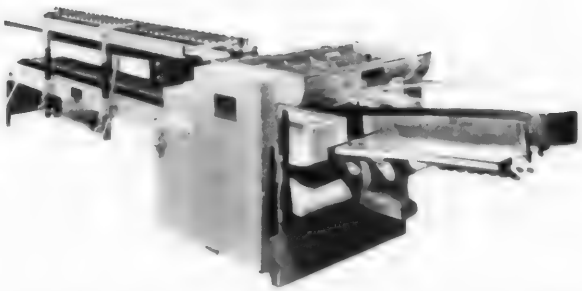
An unusual type of pneumatic dispenser, of which can filling is only one of the many applications, is made by Equipment Repairs, Ltd. Known as the *Bexuda* exact volume extruder, this machine is said to dispense liquids of high or low viscosity with 100% accuracy. Foods containing solid particles can also be handled. The filler is made in several sizes, each of which is infinitely adjustable within a certain range, and it is therefore able to meet any requirements from virtually nil up to 10 gal. The smallest size available has a capacity of up to ½ oz., and the next size is adjustable up to 3 oz. The size above this is adjustable from 2 oz. up to 10 oz., the next size again deals with quantities from 10 oz. to 20 oz., and so on up the scale.

Multiple units are also avail-



Rotary syruping machine by Robert Kellie and Son, Ltd.

able, and an 8-head filler is illustrated. Cans can be presented to the filler arranged transversely or lengthwise on a belt conveyor, which stops automatically when the cans are positioned under the filling heads. The machines are charged by using a pressurised container or pump, but a hopper-fed, vacuum-charged model is also available for filling products such as Christmas puddings and mincemeat to which pressures might prove harmful.



A compact case glueing and sealing machine made by Frederick C. Kane, Ltd.

Heat-processing equipment

With many types of canned goods, some form of heat processing is necessary after filling. Where the goods are filled cold, the next stage after filling may be exhausting. This is done either in the open can before the seaming on of the cover, or under a clinched cover before the final seaming operation. Several types of exhauster are made by Frederick Braby and Co., Ltd. These include diamond and crescent type chain exhausters and those of the straight-through type. A 2-tier model by this firm is illustrated.

After the final seaming of the cans, the processing proper is carried out, and Frederick Braby and Co., Ltd., also supply vertical and horizontal retorts for this purpose.

There has been an increasing demand in recent years for agitating sterilisers, which appreciably shorten the necessary processing and cooling times, and avoid overcooking of the product, particularly when large cans are used. A batch-type rotary agitating steriliser, the *Millwall*, is made by John Fraser and Son, Ltd. Standard sizes of this machine have capacities of 40 and of 85 cases of 48 6-oz. cans. For small-scale production and experimental purposes, a steriliser holding 5 cases is available. All controls and instruments on the sterilisers are grouped on the front of the unit for ease of operation, and quick-operating doors at each end permit rapid loading and unloading. Agitation is effected by loading the cans into cages mounted on a central horizontal shaft, which revolves at the rate of 6 r.p.m. Pressures up to 30 lb. p.s.i. can be obtained in the retort, which gives an ample margin for cooling under pressure.

Two-tier exhauster made by Frederick Braby and Co., Ltd.

Single-cage units, of considerably lower cost than the multi-cage type, have also been developed. The largest of these has a capacity of about 210 A.10 cans, 1,250 No. 1 cans, or 2,500 6-oz. cream cans. It is equipped with pressure cooling and manually controlled valves to all services, and costs less than £1,000 ex-works.

Can coolers

Various types of machine are available for cooling the cans after processing. In the *Kellie* continuous cooling tank, retort crates complete with cans are lowered into the feed end, where they are hooked on to trolleys. A motor-driven overhead conveyor then pulls them through the cooling water at a speed which can be instantly adjusted to give an immersion time anywhere between 15 and 60 min., depending on the nature of the product and the size of the cans. At the delivery end the crates are automatically raised and withdrawn from the water, unhooked from the trolleys, and delivered on to a roller delivery table. The trolleys return automatically to the feed end for the cycle of operations to be repeated. A typical tank may measure 46 ft. long by 4 ft. 3 in. wide, and have an overall height of 9 ft. 6 in. Such a tank will hold 9 retort crates at one time.

A continuous rotary cooler for cans is also featured among the range of canning equipment made by Frederick Braby and Co., Ltd.

Labelling and casing

An improved can labeller has recently been introduced by the

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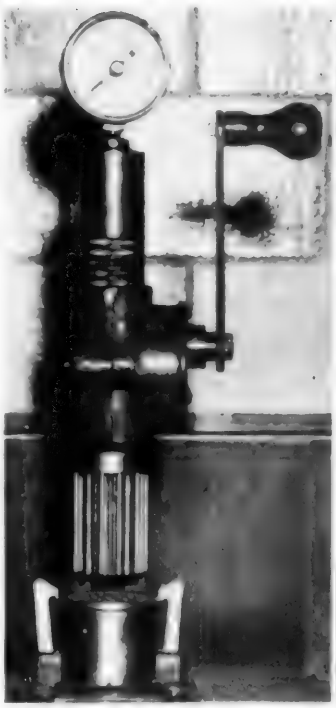


Texturemeter

Mobile research laboratory

New tenderometer

Research Equipment for VEGETABLE CANNING

The food processing laboratory at the University of Maryland is one of the most advanced scientific food research institutes in the world. It specialises in the investigation of canning crops and up-to-date food processing methods. Workers at the laboratory have at their disposal a range of modern equipment, much of it designed by themselves, of which we give here an illustrated review.

THE food processing laboratory at the University of Maryland is attached to the Department of Horticulture, which is itself a part of the College of Agriculture. The laboratory is headed by Dr. I. C. Haut, and the processing work is under the immediate charge of Mr. E. P. Walls. Workers in the laboratory have been responsible for the design and development of several instruments for increasing the accuracy of quality control in vegetable processing, some of which are described below.

Field research laboratory

The field research laboratory is mounted on a one-ton truck, and is 6 ft. high, 7 ft. wide, and 12 ft. long. It contains a water tank, bottled gas, and an electric generator so that it is a complete laboratory unit which may be operated at any place. It is used in regional work for developing methods for determining quality of vegetables. By using it, data may be obtained immediately in the field. The season for any particular crop may be extended by continuing work in other climatic regions.

Miniature tenderometer

This is a new instrument for measuring the hardness of peas, developed by Kramer and Burkhardt at the University of Maryland. The peas are placed in a sample cup and sheared by means of bars of steel $\frac{1}{8}$-in. thick. The machine is portable, relatively inexpensive, may be standardised easily, and is much more precise than the "texturemeter."

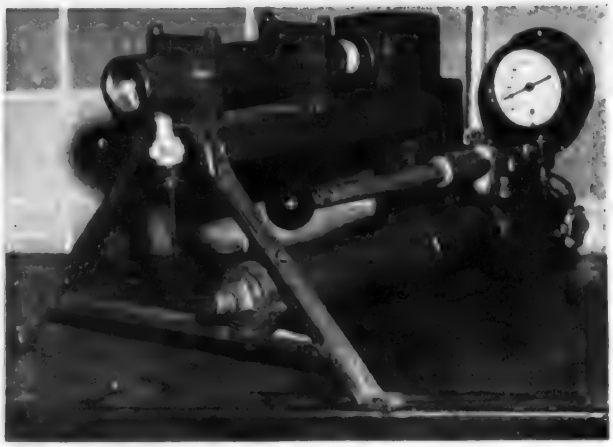
New tenderometer

This was developed by Dr. Martin, of the American Can Company, for measuring the quality of raw peas. It is an exceptionally precise instrument but it is bulky, relatively expensive, and not easily standardised. Relation of tenderometer values on raw peas to the quality of the canned product has been established by Walls and Kramer.

Adams' consistometer

This consistometer was designed by Adams, of the Kroger Founda-

Miniature experimental blancher



Succulometer

tion, and has been adapted by Walls and Kramer for use in cream-style corn. The instrument consists of a chromium finished plate, graduated in concentric rings at ¼-in. intervals. The sample is placed in a cone and upon release of the cone the material spreads, the extent of the spread being a measure of the consistency of the product.

Texturemeter

This was developed by Christel for measuring hardness of raw peas. The machine contains a number of prongs which are forced through a mass of peas that are held in the sample box. The resistance of the peas to the prongs is a measure of the hardness of the peas. The instrument is small, compact, relatively inexpensive, and may be easily standardised; however, it is not as precise as is desirable.

Succulometer

This instrument has been developed by Kramer and Burkhardt for the purpose of measuring quality of raw and canned sweet corn. A sample of cut kernels is placed in the sample box and subjected to 500 lb. pressure for 3 min.

The easily extractable juice which is pressed from the corn is a measure of the quality of the corn.

Its application to other products is under study. A semi-automatic model has also been developed.

Miniature experimental blancher

This is a small-scale blancher for experimental purposes. Otherwise it is identical to a canning plant blancher. It is of stainless steel construction throughout. Temperature controls are regulated to ±1°F. at either end. A variable speed motor makes possible timing of blanching to ±2 sec.

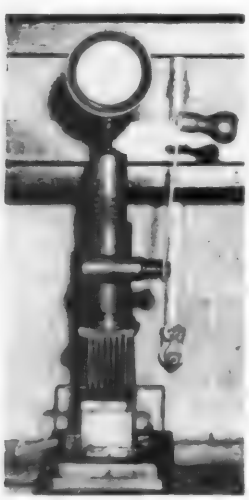
Other facilities

Another instrument developed in the laboratories but not illustrated is a small shearing device. This may be equipped with blades of different thicknesses, and may be used to measure the resistance to shearing of individual units of peas, beans, asparagus and other vegetables. Readings of up to 50 lb. pressure can be recorded.

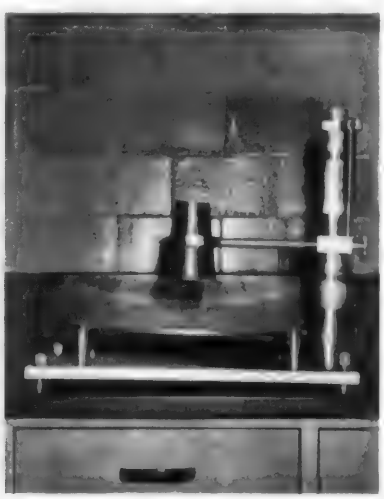
Other facilities available include a grading room with special lights designed to give illumination equivalent to that of a cloudy day. Organoleptic tests are made in this room, under standard conditions of illumination, to correlate the newly developed objective test with existing subjective quality standards.

Chemical studies

Studies of the chemical composition and nutritive value of various commodities, and of the respiration rates of raw vegetables, are also performed in conjunction with the quality tests. It is hoped by these means to build up a full picture of the causes of variation of quality, as well as evolving reliable objective methods for quality determination.



Left: **Miniature tenderometer.** *Right:* **Adams' consistometer.**



ASPARAGUS CANNING

How the Crop is Handled in California

By W. V. Cruess*

Over half of the asparagus canned in the U.S.A. comes from California, where the soil in certain districts is especially suitable for the crop. In this article, Dr. Cruess describes the methods used for growing, harvesting and canning white and green asparagus in California.

ASPARAGUS is grown in many sections of the United States, both in home gardens and on a commercial scale, but industrial production is limited to a few localities. About 25% of the crop, both in the United States as a whole and in California, is sold in the fresh form; about 60% of the crop is canned and about 15% is frozen, according to Hoos and Phelps.[1] The same authors state that since World War I acreage in the U.S.A. has increased by about 400%, and that in California by about 300%. Total U.S. acreage has remained fairly constant since 1942, according to Thompson,[2] who states that a total of 130,600 acres were harvested in 1951, about half of it in California.

Statistics

Before 1934, according to Hanna,[3] California packed over 90% of the asparagus canned in the U.S.A.; in 1945 it canned only 63% of the total. In 1955, according to *Western Canner and Packer*,[4] California packed about 59% of the total. In that year the total U.S. packs were 2,167,000 cases of white asparagus and 4,902,000 of green, while California packed 2,167,000 cases of white and 1,977,000 cases of green. California, it will be seen, packs all the U.S. canned white asparagus. The total U.S. pack in 1954 was 1,356,000 cases of white and 4,256,000 cases of green. The California pack for that year was 1,356,000 cases of white and 1,622,000 cases of green.

For comparison, 28,700,000 lb. of asparagus was frozen in the U.S. as a whole in 1955 and 6,400,000 lb. in California. These correspond to about 1,200,000 and 260,000 cases of canned asparagus respectively.

Culture

In California, seed from selected plants is planted in the nursery. After one season's growth the crowns are dug up by plough or special machine. These are planted 5 to 8 in. deep in a furrow in soil that has been ploughed deep and well cultivated. The distance between rows is 5 to 8 ft., and about 18-24 in. is allowed between plants in the rows. One year from planting, 2 to 3 weeks cutting is possible; at two years it is possible to cut for 6-8 weeks and thereafter for about 12 weeks. A plantation lasts 12 to 18 years. Other crops are then grown for several years as the soil is unsuitable for growing a new planting.

The asparagus harvested in California early in the season is sold in the fresh market as it brings a high price. Canning normally begins about April 1, and ends about June 15 or later. Green asparagus is canned during the early half of the season. This is grown in nearly level fields, the ridges being quite low. In the latter half of the harvesting season the rows are ridged high by special machinery so that the spears must grow through a thick layer of loose soil to reach the surface. They are then cut 8-9 in. in length, much of the spear being below the surface of the soil, thus giving white spears. Asparagus spears grow very rapidly, as

* University of California.

Two methods of cooling the harvested asparagus. (*Left*): Lug boxes are immersed on pallets in a tank in which iced water is circulated. Immersion lasts for 10 min. or more and the asparagus is cooled to 40°F. (*Right*): A hydrocooler operating at a field station. The pallet loads of lidded boxes are filled into the cooler, where iced water is pumped over the boxes and flows downwards through them to cool the asparagus.

much as an inch per hour in warm weather, making it necessary to cut twice a day under such conditions.

The principal region for production of asparagus for canning in California is in the central part of the state in the delta of the San Joaquin and Sacramento rivers. The soil is a deep peaty or muck soil, high in organic matter. Water is furnished by sub-irrigation during the growing season and often the fields are flooded to a depth of 10-12 in. for several weeks in the winter.

The variety grown in California is Mary Washington; in the eastern and mid-western states Martha Washington is chiefly grown. Mary Washington is fairly resistant to rust, which at one time was a very serious asparagus disease in this state. The asparagus beetle is a serious pest but may be controlled by dusting or spraying the "ferns" (above ground plants) after the cutting season is ended. The garden centipede attacks the spears, making many small holes, around which hard fibres form, rendering the affected white spears unfit for canning. Flooding the fields, according to Hanna,[3] is the only practical means of control. In badly affected fields only green asparagus is cut, as the green spears are above ground level and are not attacked.

If the cutting season is too prolonged the next year's crop is apt to be small, as Hanna points out, because too little time is available for replenishing the crowns by the ferns before they become dormant in the fall.

Cutting

The spears are cut by hand, one by one, by a special long-handled, spade-shaped knife made for the purpose. In California, this work is done at present largely by Mexican nationals, imported for the season under a special temporary immigration permit. They are returned to Mexico later in the year, although they may be used in harvesting other crops also. The cutters usually work in rather large groups of 25 to 50 men under the cannery's field men.

The spears are cut to a length of about 8-9 in., as previously mentioned, and customarily the spears from 6 rows are placed in neat piles on two rows. A motorised "sled" manned by a driver and loader is driven between these two rows. On the sled rest two large field boxes. As the unit moves slowly along the rows the loader gathers up the small piles of "grass" and places them in the two boxes on the sled. Each box holds about 550 lb. of asparagus.

The boxes when filled are covered with a wet canvas and placed on a platform from which they are picked up by truck and transported to the field house. The boxes are on small wheels that permit easy handling.

Field house operations

As they arrive at the field house the spears are usually 8-9 in. in length. Workmen place them on a slowly moving chain conveyor with the blossom ends of the spears resting against the metal wall that extends the full length of the conveyor. A rapidly revolving circular knife or band saw cuts off the butts to give spears uniformly 7 in. long, as the chain conveyor carries them forward. Powerful sprays of water wash most of the soil from the spears. The washed spears are placed in lug boxes holding about 55 lb. each. Lids made of thin shook may or may not be nailed on the boxes. This practice is less common than formerly as the spears may be precooled more readily in the usual form of hydrocooler if the boxes are not lidded.

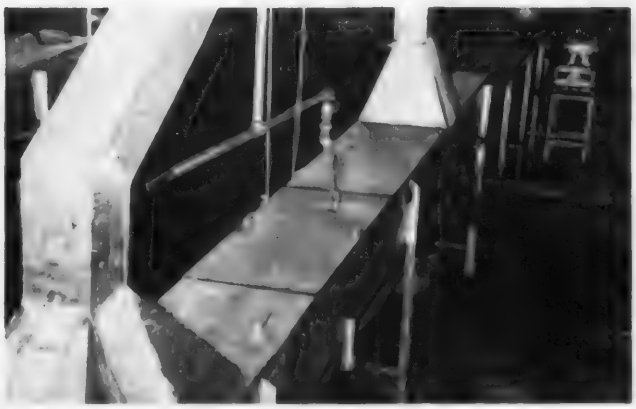
In the field houses visited in May, 1957, the filled boxes were stacked on pallets and each pallet load was transferred by lift truck to the hydrocooler as shown in the accompanying illustration. Water cooled by cakes of ice is pumped over the stack of boxes as it travels through the tunnel of the hydrocooler. The cold water flows downward through the filled boxes and chills the spears to about 40°F. The pallets of chilled "grass" are loaded on to a truck and the top layer of boxes is covered with several inches of crushed ice. A large tarpaulin is then spread over the load to prevent rapid warming of the asparagus on its way to the cannery, which may be 10 to 50 miles distant.

If the cannery is adjacent to the fields the cooling may be done there. At the Flotill cannery in Stockton, California, a large hydrocooler located outside the plant is used to cool the cut, washed asparagus in lug boxes. After cooling, the boxes are stacked in the receiving room of the cannery and iced with crushed ice until the "grass" is canned. In another plant the pallet loads of lug boxes of asparagus are immersed in a large tank of water, cooled by circulating water over cakes of ice.

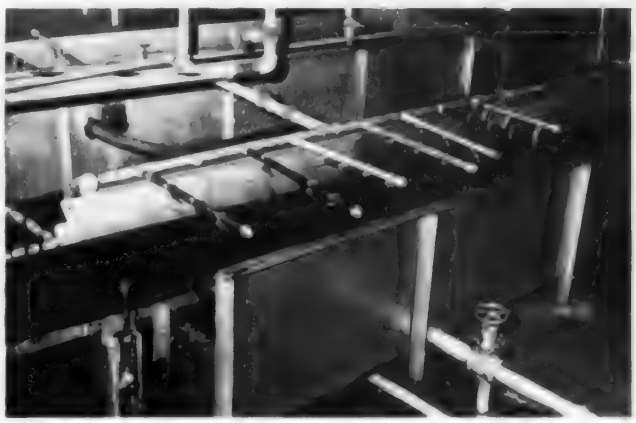
In one large plant in Antioch, California, the lidded boxes on a pallet are immersed in a tank of water which is pumped over cakes of ice. The immersion lasts 10 min. or more, until the spears are cooled to 40°F.

Cooling of the cut spears is

Spears being placed on chain conveyor which takes them to cutting knife.



A typical steam blancher, designed for continuous operation.



Conveyer belt with water sprays for cooling the blanched asparagus.

necessary to prevent undue toughening which occurs rapidly at temperatures existing outdoors or in the cannery. The butt ends of spears are especially prone to develop fibre on standing after cutting. Also if the spears are allowed to stand too long before canning they lengthen and the blossom ends may become smaller in diameter. Such changes are more rapid in the white than in the all-green stalks.

To qualify as green the spears must have at least $3\frac{1}{2}$ in. of green, according to Hanna.[3] In the early days of the industry practically all of the asparagus canned in California was white. With the increasing demand for the green asparagus in the fresh market and the canning of green asparagus in other states, the pack of canned green asparagus in California is now nearly as large as that of the white; and in the U.S. as a whole the canned green asparagus pack is more than twice as large as the white. As previously mentioned, California is the only state that cans white asparagus, probably because it can be produced in excellent quality when grown in the friable, peaty soils of the Sacramento-San Joaquin delta. The spears grow straight and of large diameter in this peculiar soil.

Treatment at the cannery

Cutting. At the cannery one of the first operations is cutting the asparagus spears to canning length. Formerly the spears were size graded by hand and sorted for colour, then placed in 3 lb. open boxes with the blossom ends against the rear wall of the box. The box then passed beneath a circular knife that cut the spears to the proper length for canning.

Nowadays, the spears are placed on a chain conveyor as shown in one of the photographs with the blossom ends against the guard wall of the conveyor line. Lugs on the chain carry the spears to a rapidly revolving circular knife, or a band saw, that cuts off the butts. These are discarded as waste. Next a second knife or saw cuts off about $1\frac{1}{2}$ in. of the butt end of each spear as a "centre cut." The "centre cuts" are sorted and the less fibrous ones canned for use as soup stock, etc.

First washing. The trimmed spears next travel through rapidly revolving sets of horizontal, cylindrical brushes and heavy sprays of water; the combined effect is one of very thorough washing. The spears are then usually given a preliminary sorting to remove crooked, over-mature and other defective or unfit specimens. The better of these are cut into short lengths and canned. The normal spears may be given a second brush washing before blanching.

Blanching. Until a few years ago the spears were blanched in large baskets or on a conveyor in hot water at or near the boiling point. At present, however, they are usually blanched in live steam. Time of exposure to the steam ranges from $1\frac{1}{2}$ to 3 min., being on the average about 2 min. In at least one cannery the spears are blanched in water at 190°F., on the theory that less damage is liable to occur to the buds. They are then cooled either by fluming in cold water or by sprays of cold water. A typical blancher and spray cooler are illustrated.

Second washing. The blanched asparagus is washed by revolving brushes and sprays.

Grading and canning. The blanched, cooled, washed spears are conveyed by belt or flume to the sorting and canning belt shown in one of the photographs. Here, women sort the spears into several sizes and place them in cans. Formerly many sizes and several colour segregations were made. Also, mechanical size graders were used in several plants. At present, however, fewer size segregations are made and the practice is to combine two or three sizes in each can. The U.S. Department of Agriculture has given the size standards used in the industry, which are listed in Table 1.

One cannery in 1955 was packing chiefly in three size designations, namely: i, a blend of mammoth, extra large and large; ii, medium and large and; iii, medium and small blend. How-

Table I. Size Standards Used in Asparagus Canning

Size Designation	Approximate diameter of base of spears	Range of number of spears, tips or points per container		
		No. 1 (Eastern) Can	No. 300 Can	No. 2 Can
No. 1 Small	$\frac{3}{4}$ in.	31 to 40	39 to 51	51 to 67
No. 2 Medium	$\frac{1}{2}$,,	23 to 30	26 to 38	34 to 50
No. 3 Large	$\frac{5}{16}$,,	17 to 22	19 to 25	25 to 33
No. 4 Extra large	$\frac{7}{16}$,, and over	7 to 16	9 to 18	12 to 24

ever, practice varies considerably in respect to size grades.

Most of the spears are canned full length; however, some are cut to shorter length and canned as tips and some are cut into short lengths and canned as cut asparagus. In a cannery in New Jersey in 1951 most of the asparagus (all green in this case) was packed in short cut pieces rather than as full length spears.

In some canneries asparagus spears of three types, namely, all-white, green tipped, and all-green are canned, the green tipped being green for a short distance on the blossom end. If canned as all-green, according to Hanna,[3] each spear must have at least $3\frac{1}{2}$ in. of green.

Cans. Until a few years ago most California asparagus was canned in rectangular ("square") cans on the supposition that the spears were held more tightly in position in the square than in the cylindrical cans and, therefore, were subject to less breakage of the blossom ends. However, at present the rectangular cans have been almost completely discarded in favour of the cylindrical, such as those shown in the table of U.S.D.A. size standards. The 8 oz. size may be used for tips and the No. 10 for soup cuts and cut spears, as well as for full length spears or tips, for institutional uses such as restaurants, hotels, the military, etc.

Exhausting and salting. In some canneries cold water is used to fill the cans and they are then exhausted 4-6 min. in live steam. A pellet or measured volume of salt is then added by automatic dispenser to each can. In at least one large cannery the filled cans are filled with very hot water and salt is added by dispenser; no exhaust is given in this procedure. Another procedure is to fill with warm water, add salt and seal the cans under vacuum.

Retorting. The cans are sealed (double seamed) in the usual manner. They are then sterilised under State Board of Health inspection and for times and temperatures specified by the cannery inspection service of that agency. The retorts are equipped with recording thermometers and temperature controllers. In most cases large cylindrical, horizontal retorts are used. The cans are held in crates on cars of the usual type. The process time for No. 2 and smaller sizes of cans of white asparagus at 240°F. is 24 min. At 248°F. it is 12 min. For all-green asparagus the process at 240°F. is 26 min. and at 248° is 13 min. For No. 10 cans of both the white and the all-green asparagus, the process time at 240°F. is 35 min. and at 248°F. 15 min.

The cans should be processed in such a position that the stalks are upright in order to permit convection currents during retorting. The cans are promptly cooled in the retort with cold water in the usual manner. Air pressure during the initial stages of cooling is essential with No. 10 cans, to prevent buckling.

Continuous pressure retorts have also been used for the smaller sizes of cans.

Defects in canned asparagus

Blackening of green asparagus. Occasional cans of all green asparagus, especially the No. 10 cans of short pieces on tips, become black in colour on standing a few minutes after the can is opened. Research by Marsh and associates in the Food Technology Department of the University of California, indicates that the dark

Sorting and canning the blanched asparagus—a hand operation. Empty cans are delivered automatically to each operative.

colour is a compound of ferric iron and rutin or an orthodihydroxy phenolic substance derived from rutin. In other words, the ferrous iron dissolved from the steel plate of the can is oxidised to the ferric state after the can is opened and then reacts with the rutin to give the dark colour. Tips are richer in rutin than are the butt ends of the spears, and therefore, are more prone to darken.

The National Canners' Research Laboratory of Berkeley, California, which is co-operating with the University in the research, states in its 1956 report that not all cans of green tips turn dark on standing after opening and that, therefore, a third factor may be involved. The University is investigating the buffer system of asparagus, in the hope that it may uncover the third factor (the two known factors being rutin content and iron). Encouraging results have been obtained in the National Canners' Association's investigations by adding calcium citrate to the brine used in canning or by the use of alum in the blanching water. Several years ago, Wiegand of Oregon State Agricultural College found that addition of a small amount of citric acid to the canning brine prevented darkening in his experiments.

General view of canning table.

Yellow crystals. Frequently yellow, waxy crystals are found in canned asparagus. H. Campbell, then a member of the U.S.D.A., found that the crystals were of a flavonol glucoside. The crystals are harmless to consumers and tend to dissolve on heating the asparagus for serving.

Thermophilic spoilage. At one time considerable spoilage, some of it gaseous, of canned asparagus occurred by development of spores of thermophilic bacteria. Research at the National Canners' Association showed that the spores are soil-borne, some fields being particularly heavily infected. Thorough washing to reduce soil contamination to a minimum and the use of more severe processing (sterilisation) of the canned product has eliminated most spoilage of this type. Cases are on record, however, where a field has been so heavily contaminated that the asparagus produced on it had to be sold on the fresh market or for freezing rather than used for canning.

Waste disposal

The waste accumulating during the whole process amounts to 40-60% of the weight of the spears as cut in the fields. Some of this waste accumulates at the field cutting house and some at the cannery.

Formerly much of the waste butts was disposed of by dumping it into the Sacramento or San Joaquin rivers, but the Fish and Game Commission of the state objects to this as being detrimental to game fish, such as striped bass.

The butts can be spread on the land where they dry and can be ploughed under later; alternatively, the butts may be allowed to rot in piles near the field house and the dried material spread on the land to be ploughed under. If disposed of in a city sewage system, the waste can be disintegrated with water to a thin puree before allowing it to enter the city sewer.

The butts contain 95% or more of water and hence, although they are useful as stock feed when dried, the "dry-away" is so large and the yield so small that such use appears to be economically impracticable.

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Acknowledgments

The author wishes to express his appreciation to the Flotill Canning Company, the Western California Canneries, the Thornton Canning Company and the Sun Garden Company for permission to take photographs of interior views in their plants and for information on canning operations; and to the California Packing Corporation for permission to take photographs of certain field operations.

Canning Equipment

(*From page 54*)

Purdy Machinery Co., Ltd. Known as the *New Way* Model E, this labeller introduces a high-discharge mechanism which often eliminates the need for a can elevator between the labeller and the casing unit. The labeller is adjustable to suit a range of can sizes, and adjustments are said to be easily made by means of readily accessible hand wheels, using built-in scales or calliper gauges. The label bed has a 3,000-label capacity, and a continuous label feed can be incorporated where required.

Several machines for handling cans are made by Frederick C. Kane, Ltd. These include can accumulating tables, which may be used for feeding labellers, casing machines or other equipment. A simplified can packing machine made by the same firm is said to handle standard sized cans at speeds of up to 400 cans per min., according to the pack arrangement. It can be supplied with or without elevators.

The same firm also makes a compact case glueing and sealing machine for glueing top and bottom flaps, with a capacity of 25 cases per min.

An Invitation to Authors

The publishers of FOOD MANUFACTURE invite the submission of manuscripts of books to be considered for publication. All manuscripts will be promptly acknowledged and carefully considered by qualified experts. A synopsis with chapter headings should be sent in the first instance to:

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Leonard Hill are specialists in industrial, technical and scientific books. They have a reputation for vigorous and successful promotion of their books by extensive advertising and maintain a world-wide selling and distributing organisation.

(*Left*): **Fropax quick-frozen red currants—a line not frequently encountered. Fropax have just been granted Her Majesty's Royal Warrant as "Suppliers of Frozen Foods."** (*Right*): **Clotted Devonshire cream, a product recently added to the range packed by Young's Potted Shrimps, Ltd.**

QUICK-FROZEN FOODS

Recent developments in one of the newest branches of food manufacture

Smedley's new cold store

WORK on Smedley's new cold store at Barr Common, near Walsall, is expected to be complete by February, 1958. The 500-ton store will house the entire range of Smedley's frozen fruits, vegetables, fish, poultry and meat products to give on-the-spot service to wholesalers and stockists of quick-frozen foods in the Greater Birmingham area.

At present, Smedley's serve the district from their Evesham store forty miles away with a fleet of Morris refrigerated trucks, each carrying two tons of frozen food. From Barr Common the fleet will be less than 30 minutes' run from the city centre, and within easy striking distance of neighbouring towns.

The main store is on the ground level and sales offices are sited on the first floor at the rear of the building. Goods for despatch will be moved from the store to an air-lock chamber before leaving the building. A raised loading deck facilitates speedy transference to waiting trucks. Refrigeration plant by York Shipley, Ltd., now being installed is similar to that in use at Smedley's modern Whyteleafe (Surrey) cold store, which services wholesalers and stockists in the Home Counties. At this Whyteleafe store—completed last year—the floor area is over 5,000 sq. ft. and the building is lined with an 8 in. layer of cork.

Eskimo Foods expand

Just over a year ago Eskimo Foods, Ltd., as they were later to become, opened in Hull what they consider to be the most modern fish processing factory in the world, and the factory is now in full production. The factory incorporates a 500-ton store, and is capable of producing 35,000 packets of fish fillets per day.

The air lock chamber at Smedley's cold store at Whyteleaf. Behind the doors the temperature rarely rises above −15°F.

The merger which brought Eskimo Foods, Ltd., into being took place on October 1 last, and the new company has since then expanded its activities rapidly. Amongst its latest products are chicken and steak and kidney pies, and these are reported to have met with an encouraging demand in both the home and export markets.

A new fish and chip pack has been introduced within the last three months, and as demand for this and other products such as fish cakes and fish sticks continues to increase, plans are already in hand for a new factory at Grimsby. This will cover an area of 3,000 sq. yds., and will be confined mainly to the production of fish and fish products, though facilities will be provided for other foods to be frozen should circumstances demand it. The building of this plant will commence in March, and should be complete by September, 1959.

Meanwhile, construction has already begun on a new 2,000-ton cold store at Hull, and it is hoped to open this in July.

Smedley's individually frozen fillets of Scotch haddock are sealed in polythene containers.

Strawberries and cream—the strawberries from Kent and the cream from Australia—two of the frozen foods distributed by Lovell, Wall and Co., Ltd.

New Isle of Man cold store

Birds Eye Foods have recently improved their distribution facilities in the Isle of Man by the opening of a new cold store. The store is mobile and is sectionally constructed. It is insulated with 8-in. cork board, and is fitted with an air-lock. The erection and installation was carried out by Smith's Installations, and the store was refrigerated by Lightfoot.

Smethursts' new range

Another recent development in the frozen food industry is the introduction by Smethursts, Grimsby, Ltd., of a retail range under the brand name *Regent*. About 1928, using the "Z" process, a technique used prior to the application in this country of Clarence Birdseye's revolutionary discoveries, fish was quick-frozen for the first time in this country in the Smethursts factory. Since then the company has developed its business of supplying quality quick-frozen vegetables and fish to the catering trade and unfrozen fish cakes and other products to the retail trade.

Since January, 1957, Smethursts have been associated with Birds Eye Foods, Ltd. The integration of the two concerns gave Smethursts an increased range of technical facilities, and they now feel confident in expanding their activities in the retail market.

Mr. A. C. Emmerson, marketing manager of Smethursts, has announced that the *Regent* range will, at first, consist of the three most popular quick-frozen vegetables—English-grown peas, sliced green beans and broad beans. Smethursts' fish cakes and *Chicklettes* will now also be available in quick-frozen form.

The fish cake recipe will include tomato—an addition which market research has proved to be welcome to the consumer.

The vegetable packs will be marketed in waxed cartons, wrapped with printed heat-sealed wrappers. The fish cakes and Chicklettes will be wrapped in pairs in freezing-quality film.

Fropax developments

Fropax have done considerable research in recent years on different vegetable packs, and they now report benefits by way of increasing sales in packs of spinach, broccoli spears, baby brussel sprouts and broad beans. A very good demand has also been shown for corn-on-the-cob, which is reported to be rapidly increasing in popularity. A wide range of soft fruits, including blackberries, red currants and gooseberries, are also packed by Fropax. The firm also prepare a number of fish packs, and their recently introduced lemon sole and smoked haddock are said to have met with a good reception.

Her Majesty the Queen recently granted her Royal Warrant of Appointment to Fropax as "Suppliers of Frozen Foods."

Part of the fish-stick production line at the Eskimo frozen food factory at Hull.

Smethursts' packs of quick-frozen fish cakes and Chicklettes

Mr. A. C. Emmerson, marketing manager of Smethursts, responsible for launching their new Regent foods.

New packs for Young's

Three new packs have recently been added to the range of quick-frozen products made by Young's Potted Shrimps, Ltd. These are Devonshire clotted cleam, potted scampi, and Yarmouth bloaters. The clotted cream is marketed in 2-oz. and 6-oz. sizes, and a large 2-lb. pack is also available. The potted scampi is packed in 2-oz. and 4-oz. polystyrene containers. It is cooked in butter and suitably spiced. The Yarmouth bloaters are packed headless and boneless, ready for cooking.

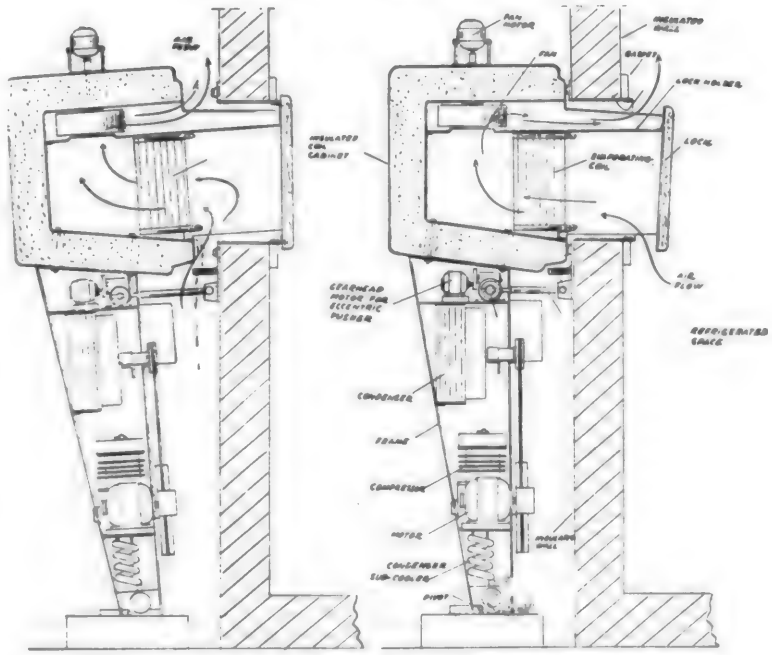
Frozen foods from abroad

Quick-frozen foods from Western Europe and Scandinavia, as well as from the Dominions, are included in the products distributed by Lovell, Wall and Co., Ltd. From Hastings, New Zealand, they receive high quality garden peas packed by J. Wattie Canneries, Ltd., and from Australia comes Devondale frozen cream. The company also distributes *White Cap* fruit salad, packed from fruit imported from the Dominions, and *Peterhouse* brand produce, which is packed in Kent. Peas, beans and strawberries are included in the latter range.

Refrigeration engineers expand

Harcold Refrigeration Co., Ltd., are extending their premises at Perivale, Middlesex, by approximately 8,000 sq. ft., in order to increase their installation and servicing facilities.

"Packaged" Refrigeration Unit



An interesting introduction in the field of cold storage is a "packaged" refrigeration unit now being marketed by Clarke-Built, Ltd. Known as the *Wiri*, the unit is of Italian manufacture, and may be fitted outside any insulated room which it is desired to refrigerate. Each unit is completely self-contained, and ready for installation. No wiring is required as the unit plugs in to the nearest mains point. A schematic view of the unit is reproduced above.

Defrosting is automatic, being actuated by a timer at 4 to 6 hr. intervals. As air-defrosting of the expansion coils takes place outside the refrigerated room, no hot gas or electric resistance heaters are required. Neither extra load nor vapour build-up occurs within the cold room.

The unit is said to be suitable for any application where low storage temperatures are necessary, particularly where the room is in constant service and no increase in temperature can be tolerated. Suggested applications are for ice cream depots and stores for frozen meat, fruit, and vegetables.

FOOD MANUFACTURE
ANNUAL REVIEW

Fruit and Vegetable Canning and Freezing

Denis Dickinson,* M.Sc., Ph.D. F.R.S.H.

Conferences ★ Colouring matter ★ Enzymes
Possibilities of nisin ★ Effluent disposal ★ Publications

THE past year has not produced any spectacular advances such as may be reflected in the revolutionary design of machinery or equipment, but it has been marked by solid advances in research, the foundation for future technological improvements. The emphasis in the fruit and vegetable canning industry of today is on quality, and improvements are chiefly those which are intended to raise the level of the quality of the goods reaching the consumer.

Conference on peas

There have been several important meetings during the year at which the underlying causes of quality in fruits and vegetables have been discussed. One of these was held in Cambridge in June.[1] It was sponsored jointly by the Low Temperature Research Station and the Fruit and Vegetable Canning and Quick Freezing Research Association, and was intended to bring together research workers having a scientific or technological interest in peas. The response was most encouraging, papers being contributed by workers in Australia, Belgium, Germany, and the U.S.A., as well as by several in the United Kingdom.

Changes in the composition of the pea during growth and storage were considered in detail in relation to the harvesting and preservation of the crop by canning or quick freezing. The amount and intensity of the research work on peas is quite surprising. It stems from the fact that although the industry is well established, several fundamental problems have so far defied the efforts of the scientists working on them—thus we do not know what constituents of the pea contribute to its tenderometer reading, although this reading is very widely employed as a measure of quality. There are similar problems connected with processed peas; for example, hard water is known to induce hardness in peas soaked or blanched in it, but the mechanism of this effect is not known. Until such problems are solved there is no prospect of avoiding the embarrassment introduced by the occasional occurrence of an exception to what is regarded as the rule. Meetings such as that held in Cambridge help materially towards the solution of such problems.

* The Fruit and Vegetable Canning and Quick Freezing Research Association, Chipping Campden, Glos.

Quality control

Quality in a broader sense was dealt with at a symposium on the Quality Control of Food arranged by the Food Group of the Society of Chemical Industry, and the Association of Public Analysts.[2] The purpose of the meeting was to demonstrate the utility of a statistical approach to quality control, but as far as canned fruit and vegetables were concerned, Mr. W. B. Adam pointed out that statistical methods are not of great value except in deciding the importance of a sample. The individual units of fruit or vegetable vary so widely in character—whether it be in respect of colour, flavour, or texture—and they are preserved to such a large extent as units, that precision in the estimate of a quality characteristic is quite impossible. In the extreme case, a rogue pea becomes a black or red pea when canned; it does not distribute its colour among the other peas in the can. Consequently the effect of its presence on the score for colour must be both arbitrary (according to a prearranged scale) and, statistically speaking, disproportionately large.

Colouring matter

This matter of unwanted colours developing in canned green vegetables has been known for some time to be associated with the presence of natural red, blue or purple colours in the plant and generally in the flower. It is an inherited characteristic. Recently, a note has been published describing how a simple chemical test can be applied to broad beans to determine their freedom from unwanted colouring matters and hence their suitability for canning.[3] As the characteristic of colour production on heating is transmitted directly from the seed to the crop, it is sufficient in this instance to test the seed bean for the presence of leucoanthocyanin, the class of substance responsible. Campden Research Station has developed this method of sorting varieties and is at

present engaged in further research with a view to applying it or adapting it to other vegetables and fruits intended for canning.

Because natural colouring matters have not always been sufficiently stable to withstand the process of canning, the industry has deemed it expedient to employ artificial colouring matters. Now, in common with the rest of the food industry, it finds itself obliged to choose its colours from a short list of permitted food colours. The various countries of the world between them now offer a large number of such lists of approved colours—all different, and all subject to continual amendment. It seems fantastic that committees composed of scientific men should disagree so widely over matters of fact. It is a most lamentable demonstration of non-co-operation. The canning industry's problems would be solved if means could be found either to stabilise the natural colouring matters during processing and storage, or to choose processes which do not destroy or noticeably change the natural colouring matters. Researches with such objects in view are being actively pursued in several centres and any research which contributes to our knowledge of the detailed composition of fruits and vegetables is also helping towards this end. It is in fact to be hoped that research will overtake legislation, as there are signs of activity in regard to the control of flavouring materials. Comparatively few canned foods include artificial flavouring materials, but if the same sort of muddle results from the investigation of flavouring matters, it cannot be other than a nuisance which would be best avoided by the preservation of natural flavour or its fortification with naturally occurring materials only. An interesting discussion of the whole subject of artificial colours and flavours in foods took place at a meeting of the Society of Chemical Industry's Food Group in October.[4]

Residual enzymes

Frozen foods do not employ artificial colouring matters; it is therefore essential that they should be protected against loss of natural colour by oxidation. Probably the greatest risk here is that of enzyme-catalysed oxidation, since many enzyme systems can utilise or attack natural colouring matters. In the case of vegetables, control of enzymes is normally achieved by effecting their inactivation by heat. This is not always easy, especially as heat-inactivated enzyme systems can sometimes be regenerated during storage. A recent review of this subject[5] has shown that there is a very real risk of trouble developing in frozen foods from this cause, and that there is plenty of scope for research into the physical properties of enzyme systems, particularly their heat resistance. Probably the main impediment to the development of frozen fruits is their susceptibility to discoloration and loss of flavour during storage and thawing, all as a result of enzyme activity. Apart from the selection of varieties less susceptible to such changes, little has been done so far in attempts to control them. The use of chemical antioxidants, such as ascorbic acid, is not entirely satisfactory.

This same subject concerns canned foods also, as has been amply demonstrated by a report on residual enzyme activity in canned stone fruit.[6] This has shown beyond doubt that accelerated attack on the exposed steel in a lacquered can may result from a heat process which is not sufficient to inactivate the enzyme systems present in the stone. It is considered that the particular enzyme system involved is a β-glucosidase, the heat resistance of which appears to be higher than expected. Whether or not this system can become regenerated during storage is a question which remains to be investigated. It is a matter of particular importance since the enzyme is one which might utilise naturally-occurring colouring matters and thus contribute to loss of colour in two ways—one by direct action on the colouring matter, the other by the effect of dissolved metals from the can on the colouring matter. The combination of anthocyanins with tin to form complexes has been investigated by Salt and Thomas in regard to the importance of anthocyanins as accelerators of the corrosion of tin under conditions similar to those obtaining inside a can of fruit.[7] They found chrysanthemin to be a comparatively inefficient depolariser in that about 5 moles were required for the dissolution of one mole of tin; the related anthocyanin, cyanin, was more than twice as efficient in dissolving tin.

Enzyme systems differ from bacteria in their faculty of regeneration after heat inactivation, and they also differ in their temperature coefficients. Consequently, although a long process at a temperature of 240°F. might be sufficient to inactivate all the enzymes in a foodstuff and also to sterilise it, it is possible for some enzyme systems to remain active after processing for a shorter time at 260°F. even though this second process might still be sufficient to sterilise the foodstuff in so far as bacterial spores are concerned. Special attention has therefore to be paid to the nature of the enzyme systems present in a material when it is proposed to employ high-temperature processing with correspondingly short times. The amount of information available which can be put to such practical use is unfortunately very small. A great deal more research work on the properties of the enzyme systems now recognised as being responsible for loss of food quality would be to the advantage of the canning and quick-freezing industries.

Possibilities of nisin

Vegetable canners have for many years recognised the extreme difficulty of producing canned foods of good quality sufficiently free from thermophilic infection to stand an incubation test at 55°C. This is because the heat resistance of the spores of certain thermophilic bacteria is so high that a process sufficient to kill them risks serious damage to the quality of the pack. For foods intended for

storage and consumption in temperate climates, the survival of thermophiles is of no account since temperatures favourable to their growth will never occur. For packs intended for shipment to or through tropical climates, however, freedom from thermophilic infection is largely essential. A new antibiotic, nisin, may eventually provide the answer to this problem, since nisin has the property of lowering the heat resistance of the spores in question and thus its incorporation in a can of vegetables would have the effect of increasing the sterilising value of a particular process. A very full and detailed review of the subject has been published by Hawley,[8] who has explained the unique advantages offered by nisin as an aid to canned food sterilisation. Experimental work on canned vegetables has been in progress for several years and has given some very encouraging results.

Effluent disposal

Canners and freezers in England and Wales are becoming increasingly aware of the activities of Local Authorities and of River Boards in regard to the purification of factory effluents. Parallel, but so far less intense, activity is also to be seen in certain other European countries where the general problem is similar. The effluent from a cannery is large and variable in volume and high in strength so that to construct conventional plant for its purification is usually uneconomic. The various methods for treatment were considered in some detail at a meeting in Liége, and the most recent developments which involve high-velocity aeration of the waste waters were described. It was concluded, however, that at the present time no method of purification other than biological filtration has yet proved to be entirely satisfactory or economic. In situations where it can be practised, disposal by spraying on to pasture or other land carrying a suitable cover crop should be considered as the preferable method of disposal. Purification by conventional methods is quite possible and has been shown to be practicable in several places, but the cost of plant is now so high that to cater for the purification of the whole of the effluent from a vegetable cannery packing all vegetables in season and including peas during June, July and August would be quite uneconomic. The seriousness of the problem is generally recognised, but no universal solution appears likely to emerge in the immediate future.

Publications

During the last year the number of books of particular interest to canners and freezers which has been published is quite unusually large. Perhaps the most outstanding event was the appearance of the fourth edition of *Canned Foods* by Baumgartner and Hersom, which was published towards the end of 1956.[9] Ever since its first appearance in a rather unimpressive war-time edition, Baumgartner's *Canned Foods* has been deservedly popular, and there can surely be no cannery in the United Kingdom which does not possess at least one copy. Tressler and Evers have revised their well-known *Freezing Preservation of Foods* into a two-volume edition.[10] The first volume deals with fresh foods of all kinds and has already appeared; the second volume, to be concerned with prepared foods, will be published in the near future. Together, these two volumes will provide a veritable encyclopædia of freezing, covering all conceivable aspects of the subject.

An unusual and quite invaluable book for those who are concerned with peas is *Les Variétés de Pois Cultivés en France* by R. Fourmont.[11] This contains full details of some 120 varieties of pea grown in France, together with 70 monochrome plates illustrating flowers, leaves, pods, and peas of as many varieties, and also several plates in colour which serve as keys for the descriptions of colour used in the text. The fact that the book is written in French should not deter even the poorest scholar; many of the varietal names are the same in both languages, and with the aid of a dictionary progress, though somewhat retarded, should still be fairly rapid. *Gloire de Witham* and *Progrès de Laxton*, for example, should not even call for a dictionary. An interesting and valuable table at the end of the book shows diagrammatically the origin of the varieties.

A book which calls for considerably more knowledge of the French language but which is of great interest and particular concern to the exporter and importer of canned foods is *La Fabrication et la Vente des Produits Alimentaires Conservés* by J. C. Fourgoux and H. Cheftel. This book is very approximately the equivalent of Bell's *Sale of Food and Drugs*, except that it concerns only canned and preserved foods. The standards of composition and other regulations current in France are of interest not only to those who may have the intention of selling their goods in the same market, but also to canners in general as giving an insight to the standard of food technology achieved in France.

Another book published in French during the year is *Les Conserves de Légumes dans l'Alimentation*, which contains the papers given and discussed at a special symposium on Preserved Vegetables in Nutrition organised by the Belgian Institute for Food and Nutrition held in Brussels in December, 1955.[13] It does not consist simply of tables of nutritive values as one might, perhaps, expect, but contains the whole of the proceedings, including some lively exchanges of view. Aimed primarily at medical dietitians, it develops the argument that canned and frozen vegetables are nutritionally superior to the average home-produced article.

Returning to books published in this country, the publication of the 18th edition of the *Food Industries Manual*,[14] in which the section on canning has been completely revised, should be mentioned. It has always been a popular reference book and is to be seen on the desks of most food manufacturers. Its influence, therefore, is very wide indeed, and it is important that it be kept up to date.

Probably only a minority of practical men have the time and the desire to read technical papers; they must perforce be content to read the occasional review and to scan the lists of titles and headlines. For them a desk library of essentially practical and concise books is a necessity, and they are fortunate in that 1956 and 1957 have seen the revision of so large a proportion of these essential sources of information. Research workers too are fortunate in that it is through the medium of the reference text book that the findings of research achieve their final acceptance and application.

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FOOD MANUFACTURE
ANNUAL REVIEW

ICE CREAM

By Eric Humphriss, A.R.I.C., M.I.Biol.

Standards ★ Weights and measures ★ Colours ★ Sampling ★ Pasteurisation ★ Formulation ★ New plant and equipment ★ Hygiene ★ Ingredients

TRADITION demands that any annual review of the ice cream trade in Gt. Britain should commence with some reference to the weather. Apparently the mild early months of 1957 were given credit in the daily press for the encouraging upward trend in sales then experienced by some of the larger manufacturers. The short-lived spell of hot weather of the early summer encouraged the trade to anticipate and plan for a bumper season; expectations, alas, were unfulfilled by subsequent meteorological events. Discretion requires that the matter be left there!

Ice cream production in the U.S.A. for 1956 was reported as equalling 650,985,000 gal. (U.S.) equivalent to 540,317,550 Imperial gal., with the figures still rising in the early months of the past year. It is interesting to note that the demand in America for sherbet appears to be falling, slightly, and that the annual production (1956) of Mellorine (vegetable-fat ice cream) was 33,345,000 U.S. gal., equal to 27,676,350 Imperial gal. One-twentieth of the total ice cream consumed in the U.S.A. would therefore appear to be of the nature of the present British product, and the rest "dairy ice cream," the "new" grade proposed in the Food Standards Committee Report on the Ice Cream Standard, (FSC/REP. 39, Sept. 1957) published early last December.

This Report, awaited with interest during the past year, will be diligently studied by all concerned. The Committee's advice to the Minister, obviously after careful study and wide consultation with the thirty or more organisations concerned, is, in the main, as follows:

1. The term "Dairy Ice Cream" should be recognised, and restricted to a product which contains no fat other than milk fat (butterfat).
2. The term "Milk Ice" should be recognised as applicable only to a product based on liquid milk and that this product should be required to contain ". . . not less than 2½% milk fat and not less than 7% milk-solids-not-fat. . . ." ". . . the addition of non-milk fat should not be permitted."
3. The minimum required fat content, for both "Dairy Ice Cream" and "Ice Cream" should remain at 5% and the M.S.N.F. at 7½%.
4. The prescribed minimum for sugar content should be abandoned altogether in all three types of product, and a prohibition of the use of saccharin or other artificial sweeteners therein, should be substituted.

The Committee, very fairly in my opinion, advise against the statutory control of overrun for the present. Doubtless the trade in general will be relieved, but others may think that the Committee have over-

emphasised the difficulties associated therewith. The Report does mention that studies are in progress with a view to overcoming these difficulties; it can therefore be safely inferred that aeration control will eventually come to pass.

While provision is made for the incidental introduction of small quantities of fat other than milk fat into dairy ice cream with special flavouring agents, *e.g.*, chocolate, cocoa, it appears that the use of glyceryl monostearate, which, of course, always contains some triglyceride, in this proposed grade of ice cream has been overlooked.

Weights and measures

The Pre-Packed Food (Weights and Measures) Regulations, 1957 (S.I. 1957, No. 1880), came into operation on January 1, 1958. These Regulations replace the Pre-Packed Food (Weights and Measures: Marking) Order, 1950.

The Fourth Schedule of the new Order exempts iced lollies and water ices from the requirements; ice cream must be marked legibly and on a plain background, on the wrapper, with the net weight or measure of the pre-packed unit. The declared weight or measure of the contents is to be in Imperial measure; if metric units are used, their Imperial equivalents must also be given; moreover, the declared volume or mass may not be qualified by such terms as "approximately" or "when packed" and so on.

Ice cream manufacturers should obtain copies of both the official publications referred to above and study them carefully.

Colours

The Colouring Matter in Food Regulations (S.I. 1957. No. 1066) came into force on June 30, 1957. These establish a list of permitted colours, and only such colours may now legally be used in any food, including, of course, ice cream and other frozen confections.

It might be worth while reminding ice cream manufacturers that there are several other Standards in force appertaining either to the product itself or to mix ingredients.

The Heat Treatment Regulations are well known, so is the maximum permissible lead content, at 1 p.p.m. for ice cream and lollies. (S.I. 1951. No. 1196) The Food Standards (Edible Gelatin) Order, 1951, and the complementary document (S.I. 1951. No. 2240) set up standards for gelatin which, among other things, differentiate between ordinary grades and those of disclosed low setting strength, and prescribes limits for ash, arsenic, lead, copper, and zinc. The Artificial Sweeteners in Food Order 1953 (S.I. 1953. No. 1311) prohibits the use of all artificial sweeteners, other than saccharin, in foods. The newly published report of the Food Standards Advisory Committee referred to above advises that saccharin be proscribed from ice cream but (presumably) not from iced lollies.

Sampling

A considerable amount of thought and study has been given during the past year to the drafting of standardised techniques for the sampling of ice cream, water ices, etc., for subsequent chemical and bacteriological examination, and to the prescribing of standard methods for the bacteriological testing of dairy products. These deliberations can be expected to bear fruit shortly in the form of publications, a development to be welcomed by those concerned with the bacteriological control of ice cream.

In this connection, it is apposite to remark that close liaison between the various authorities who lay down methods appropriate to the bacteriological appraisal of ice cream is overdue; more particularly with reference to the controversial modified methylene blue test as applied to ice cream.

Pasteurisation

The U.S. Public Health Service requirements for the heat treatment (pasteurisation) of ice cream mix are interesting.

They are as follows:

Vat Pasteurisation	=	155°F. for 30 min.
Plate ,,	=	175°F. for 25 sec.
Tubular pasteuriser	=	175°F. for 25 sec.
Vacreator	=	194°F.
Roswell heater	=	175°F. for 25 sec. or 200°F. for 3 sec.

They agree fairly closely with the British Ice Cream (Heat Treatment) Amendment Regulations, 1952, which, of course, specify three time-temperature combinations, *viz*:

150°F. for 30 min.
160°F. for 10 min.
175°F. for 15 sec.

Incidentally, according to reports, some experimental evidence has emerged which seems to suggest that "very short time—very high temperature" treatment of mix may well render unnecessary the incorporation of stabilising agents in the mix.

Formulation

Little of moment has emerged lately in the way of improvements in mix formulation. Over the past twelve or eighteen months a tendency has been noticeable towards the more widespread use of starch, usually in the form of cornflour, in the mix. This can hardly be called a development, rather is it a reversion to a former traditional practice. Thirty or more years ago virtually all the ice cream made in this country was of the "custard" variety; then came the era of the genuine dairy product ice cream, followed, in the years immediately after the last war and under the pressure of ingredient scarcity, a return to the use of starchy fillers. There was one difference, namely the employment of amyloclastic enzyme preparations, first malt extract, and then a much more powerful and effective proprietary enzymic hydrolyzing agent of microbiological origin.

The present atavistic trend may well stem from the 5% minimum fat content. Why, it is argued, should double the minimal legal requirement of the most costly basic ingredient be incorporated in the mix when the solids can be boosted to a roughly equal extent by using the relatively cheap substitute ingredient, starch? It has to be recognised that by using the extremely effective proprietary amylases referred to above, a product of 5% or so fat content is vastly improved by the roughly equal amount of starch hydrolysate thus incorporated. Moreover, mix compounding technique is not sensibly complicated, and since there is no significant increase in mix viscosity, difficulties in cooling and handling obviously do not arise.

New freezers

Among the new or improved items of plant and equipment which have recently made their appearance in this country, mention ought to be made of the Hoyer freezer. This continuous freezer, of Danish origin, is now being produced in Gt. Britain by one of the largest dairy plant manufacturers in the world. While not revolutionary in fundamental design, it has several attractive features. It is fabricated, in the main, from stainless steel, and is fitted with an easily removable nickel freezer barrel. The mix is fed into the back end of the freezer barrel by a gear type pump, and an air pressure of 40 lb. p.s.i. (or better) is maintained in the freezer barrel during freezing, the frozen aerated ice cream being "metered out" at the front end by a second gear pump located there. The mutator is of advanced design, and is fitted with three scraper blades; provision is made for hot gas defrosting in the case of an emergency "freeze-up." Close control of overrun, and economical refrigeration are claimed for this machine.

This same company is also offering a fully automatic, rotary, ice cream bar freezer, apparently manufactured here under licence. This machine is of revolutionary design, brine refrigerated, and according to the description, is fully automatic in operation. It will produce sherbet, water ices, and multi-flavoured or chocolate-coated ice cream "on a stick" ready for automatic wrapping. The first model is currently being installed by one of our largest ice cream manufacturers.

A new "three-in-one" continuous freezer, or rather, battery of three individual freezers within one cabinet, was first on view at the Dairy Show last October. This innovation, by the company who pioneered continuous freezers, comprises three separately refrigerated and controlled freezers fitted on one base and, because of the compact design, effects considerable saving in factory floor space, and so, it is claimed, in operation labour costs.

The much greater facility thus afforded the ice cream maker in the production of three flavoured ice cream units is obvious from a study of this new "three-in-one" development. The component freezers are fitted with the new "square section" mutators evolved by this company, the blades of said mutators being perforated by circular holes to even further increase efficiency of heat transference and aeration.

Wrapping machines

Another firm, has perfected several new ice cream wrapping machines. Their newest model is designed to wrap brickettes (sandwiches) with or without wooden sticks inserted therein, and is fed with ice cream direct from the continuous freezer. Automatic stick insertion can be provided for, and the sandwiches leave the machine sticked (or not, as desired) and wrapped, and are passed straight into the hardening tunnel. The machine wraps with a square-end fold.

Alternative plant made by this concern, and still dealing with ice cream direct from the freezer, will wrap sticked ice cream etc., completely enclosing the product and stick within the wrapper, which is finally crimp sealed. Carton and tub filling automatic plant is also available.

Whipping machines

At least two cream whipping machines, both based on the positive aeration principle, have recently made their appearance. I have seen them both working on a 35%-40% fat dairy cream; both undoubtedly produce a whipped product of higher overrun, and in my opinion, more elegant than that obtained by orthodox cream whipping methods. Though both machines are necessarily of interest to soda fountain and restaurant proprietors, places where cream toppings for sundaes, etc., are dispensed, the model providing for "whipped cream on tap" must prove attractive. There is nothing new in these cream aerating machines; I tested a prototype in 1937.

Cold air freezing

A new idea, of American origin involves the use of cold air instead of the orthodox refrigerated brine as the freezing medium in a machine designed to produce something akin to our ice lolly. This is only the application of the hardening tunnel principle to lolly production. Most of us have doubtless frozen "experimental" lollies in the ice cream hardening tunnel quite successfully; a procedure with many advantages, which has apparently now been developed into a workable lolly freezing unit.

Plastic tubing

Plastic tubing appears to be gaining in popularity in the States. It is being increasingly used in dairy and ice cream plants and is stated to present no difficulty in "sanitising," compared to, for example, stainless steel pipe runs. The flexible nature of this tubing obviously lends itself to the elimination of T joints, bends, elbows, etc., which can, of course, lead to "pocketing" and thus result in plant contamination especially where anything less than the most rigorous methods of plant cleaning and steri-

lisation are practiced daily. This is a *contretemps* more especially to be guarded against in the planning and evolution of *in-situ* cleaning of food handling and processing plant.

Hygiene

This brief review of recent developments in plant design illustrates the increasing attention devoted by the makers to considerations of hygiene. The newest development in freezers include special provision for their effective cleaning and sterilising; one of the foremost claims for the new packaging machinery is that the ice cream is "untouched by hand."

There is no doubt that the bacteriological quality of ice cream must from now on be maintained at the highest possible level. This means that plant and equipment manufacturers have got to design their machinery in such a way as to facilitate easy cleaning, and to permit its being kept in a sterile condition while in operation. The main source of microbiological contamination of ice cream is still from "unsterile plant"; at the moment it is perhaps fair to lay the blame for this equally on the maker of the plant and the operator.

Incidentally, it would appear that increasing significance is being attributed to the presence of fæcal streptococci in heat-treated foods, including ice cream. Some bacteriologists consider the finding of fæcal streptococci (enterococci) a more certain index of the existence of potentially dangerous "circumstances" than the presence of *Bact. coli I* (fæcal coli). One occasionally sees reports emanating from the Public Health Laboratory Service laboratories which record the presence of fæcal streptococci, so it may be inferred that the official view is veering in this direction.

The formulation and marketing of bacteriostatic and fungistatic paints is a development not without interest to the ice cream manufacturer. A brand recently brought to our notice seemed to us worth testing on such awkward loci as airlock doors, etc.

Ingredients

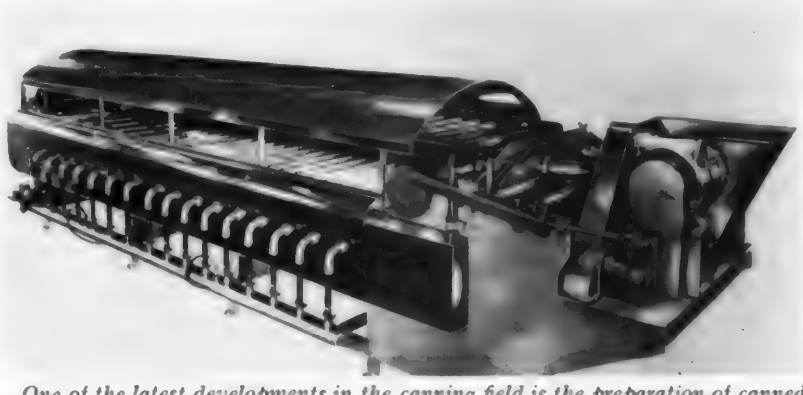
Little new has emerged recently in so far as mix ingredients are concerned. The instant soluble skim milk powder, evolved in the United States by a double spray drying process in conjunction with a controlled damping between the two desiccating stages, is, so far as we know, not yet available over here; and in any case it is likely to be too costly for serious consideration as an ice cream ingredient in the immediate future. If the process proved applicable to complete dehydrated ice cream mixes, a possibility which would require careful investigation in view of the fat and sucrose contents of mix, there might be worth while advantages accruing here.

Apparently, the Americans are now devoting some attention to the newer emulsifying agents, their effect in ice cream, and the mechanisms by which these effects are produced. In particular, the polyoxyethylene compounds, and the new sucrose esters seem to be claiming most attention. Anyone in Britain contemplating the investigation of these and similar surface active substances in foods would be well advised to first read the Report of the Food Standards Advisory Committee of the use of Stabilisers and Emulsifying agents in foods.

Finally, a great deal of discussion, some of it informed, some less erudite, has centred on the association of a luxury diet and the incidence of atherosclerosis. The Americans are particularly interested in this subject, and of course, so must the dairy and ice cream industries be.

One has read many of the papers published, or abstracts thereof, and apart from the established relationship between a high fat intake, high blood cholesterol level, and the apparently greater proneness to coronary occlusion associated therewith, one would not presume, at this stage, to write anything further on so serious a topic, except to state that whilst much has been established, much still remains to be elucidated.

Canned Fried Hamburgers



One of the latest developments in the canning field is the preparation of canned fried hamburgers. Machinery for the automatic forming and frying of hamburgers is manufactured by the Norwegian firm of O. Anhanger and Co., and is available in this country from W. J. Hart and Sons.

A typical unit is illustrated here. The meat mixture is filled into the tank of the machine, from where it is mechanically pressed into a forming device, which forms and automatically ejects the hamburgers. These fall on to the frying slats, which are in the form of an endless belt, and are conveyed through the frying section of the machine.

When the hamburgers are finished on one side they are automatically turned over so that the other side is fried to the same degree.

At the discharge end of the machine, the hamburgers are slowly moved up and out of the frying oil, and are placed in such a way that they are adequately drained and quite dry by the time they fall on to the conveyor which carries them to the packing table.

The machine is available in several sizes, and production capacities range from 2,400 to 10,000 hamburgers per hr.

MEAT

By Frank Gerrard, M.R.S.H., M.INST.M., M.INST.R.

Consumption and production ★ Hormone treatment ★ Overland transport ★ Blast freezing ★ Fat measurement ★ Ultrasonic tenderising ★ Rapid cooling

THE consumption of red meat has risen steadily throughout the Western Europe area since the end of the war, and the average meat consumption in Belgium, France, Holland, Western Germany and Italy has increased since 1954 by approximately 10 lb. per head. In Western Germany there was a heavy increase in pork production during 1955-56 with a consequent heavy consumption. There is some indication that the meat consumption, particularly beef and veal, will in these countries tend to become more uniform, but any general increase will be closely dependent upon the improvement in the general standards of living.

In the United Kingdom the figure for beef consumption was estimated to be about 9 lb. per head higher than in 1954, but other classes of meat, excluding offal and possibly canned imported meat, is thought to have decreased slightly. The overall increase in the consumption of meat (edible weight) as compared with the thirties is probably in the region of 3%-4%.

United Kingdom

The September agricultural returns of the Ministry of Agriculture for England and Wales show little change over the year in the number of cattle, although there is a slight increase of 14,000 (approx. 1%) calves on the farm compared with September, 1956 (male calves showing an increase of 2%). The population of older sheep, as at September, is always fluid, partly on account of the sales of sheep across the border from Scotland, but the general inference is that the breeding stock is still expanding. The total number of sows is now only slightly below the previous peak figures at September, 1954. (Table 1).

Beef, mutton and lamb prices on Smithfield Market have generally been above those of the previous year, but the prices of pork have been well below those of last year. The following prices will give some indication of the general position, during the week ending Friday, November 1, as compared with the same week in 1956.

Smithfield Prices

	per lb.			
	1956		1957	
	s.	d.	s.	d.
Scotch Sides of Beef	1	10½	1	11½
English ,, ,, ,, ...	1	6	1	8
Argentine ,, ,, ,, ...	1	3½	1	4½
English Pork (under 100 lb.)	2	6½	1	11

Hormone implantation

Throughout the year there has been a markedly increased interest in the use of hormone implantation for increasing the efficiency with which cattle, sheep and pigs convert their food protein into edible meat protein. Hexœstrol probably gives the best results and it is more economical to implant the hormone than to add it to the feed. It also provides more accurate control over dosage and absorption.

Treatment with the hexœstrol will have a pronounced effect on the producer's profit, as an increased weight of ½-1 cwt. in the case of steers, and 8-10 lb. with hoggets, has been obtained. The cost of treating cattle will be about 2s. per beast, including labour, and such animals should provide £5-£7 worth of extra carcase meat.

In the case of poultry, hormone treatment of intact males produces the effects of surgical caponising without affecting growth, and this results in the tendency to lay down fat. In cattle and sheep, the effect is to depress the deposition of fat and increase bone and muscle growth. It has been found that the kidney fat in treated cattle is usually very light in weight, which is a definite advantage from the butchers' point of view, but the increase in bone content is a different matter, as much of the beef sold retail is de-boned before sale.

As may be expected the administration of sex hormones might produce "side affects" about which further investigation would appear to be desirable, combined with a thorough examination of its effect on both the conformation and the physical and chemical composition of the treated carcase.

Table I. LIVESTOCK CENSUS—Official Returns as at June, 1957

ENGLAND AND WALES

	1957 (provisional)	1956
Cattle		
Cows and heifers in milk	2,617,000	2,544,000
Cows in calf but not in milk	449,000	447,000
Heifer in calf with first calf	658,000	696,000
Bulls for service	83,000	90,000
Other Cattle		
Two years old and over	1,042,000	1,124,000
One year old and under two	1,597,000	1,630,000
Under one year old	1,705,000	1,723,000
Total Cattle	8,150,000	8,253,000
Sheep		
Breeding ewes	6,222,000	6,020,000
Other Sheep		
One year old and over	2,281,000	2,264,000
Under one year old	7,516,000	6,913,000
Total Sheep	16,018,000	15,197,000
Pigs		
Breeding sows	606,000	565,000
Boars for service	36,000	35,000
Other Pigs		
Five months and over	869,000	842,000
Two months but under five	2,017,000	1,836,000
Under two months	1,209,000	1,112,000
Total Pigs	4,738,000	4,389,000

SCOTLAND

	1957 (provisional)	1956
Cattle		
Cows and heifers in milk	490,000	476,675
Cows in calf, but not in milk	71,000	72,627
Other cows retained for breeding	7,700	8,271
Heifers in calf	136,000	133,875
Bulls for service	28,900	28,908
Other Cattle		
Two years and over	228,000	212,576
One year and under two	421,000	418,115
Under one year	407,000	385,161
Total Cattle	1,790,000	1,736,208
Sheep		
Ewes for breeding	3,260,000	3,204 591
Rams for service	105,000	100,516
Other Sheep		
One year and over	1,048,000	1,017,624
Under one year	3,512,000	3,201,867
Total Sheep	7,925,000	7,524,598
Pigs		
For breeding	63,400	55,707
Other pigs	420,000	375,457
Total Pigs	483,400	431,164

NORTHERN IRELAND

	1957 (provisional)	1956
Cattle		
Cows and heifers in milk	225,740	212,020
Cows in calf but not in milk	40,860	41,370
Heifers in calf	41,040	45,570
Bulls for service	4,690	4,900
Other Cattle		
Two years and over	213,550	199,910
One year and under two	208,800	203,830
Under one year	236,340	210,030
Total Cattle	971,020	917,630
Sheep		
Breeding ewes	471,680	451,100
Rams for service	16,510	15,760
Other Sheep		
Over one year	46,200	50,590
Under one year	408,100	355,720
Total Sheep	942,490	873,170
Pigs		
For breeding	83,540	71,070
Other Pigs	661,640	581,980
Total Pigs	745,180	653,050

Compiled by Meat Trades Journal.

Another hazard is that offals from treated animals could cause sterility if fed to pets or commercial fur-bearing animals. The Ministry of Agriculture has issued a warning about this.

Argentina

There is little doubt that Argentine beef, which on Smithfield (London) represents a very high proportion of the total supplies of beef (during the week ending November 30, out of a total of 4,367 tons of beef and veal pitched on Smithfield, 2,520 tons was Argentine) does have a profound effect on all beef prices, with the possible exception of the best Scotch beef, which is in a luxury class of its own. Since the drought of 1950-52, the cattle numbers in the Argentine have been steadily increasing and various estimates imply that they now exceed some 45 million head. It would therefore appear that beef production should remain at its present high level, at least for some years. The recent tendency has been to concentrate livestock production in the areas having good transport communications with the larger marketing centres. Foot and mouth disease, still presents a major problem to the producer and it very frequently occurs just before the stock is being "finished" for slaughter. From the aspect of beef export, a more serious problem is that of the rapid and continued increase in the domestic per capita consumption of beef, coupled with the increasing population.

During the years 1935-39, with a population of 13·6 million, the beef consumption was approximately 170 lb. per head. In 1956, the population had increased to 19·7 million with a beef consumption of 213 lb. As, during recent years, the amount of beef available for export has been around 400,000 tons, it would appear that the domestic demand may absorb the current exportable surplus within the next 8-10 years. It is significant that during the period 1935-39, exports accounted for over 36% of production while in 1956 it had declined to 24%. This should prove an incentive to the British producer to increase still further the production of good quality beef. During recent years there has been a real effort to produce the smaller, more attractive early-maturing type of beast, comparable in weight and finish to those produced from the Argentine herds. This development was particularly noticeable at the various Christmas livestock and carcase competitions and it is certain that carcase judging, based upon a specific marks standard, with the information available to the exhibitor, can greatly assist the farmer to produce the most suitable type of carcase. I cannot help but think that in the long run the most

profitable carcase for the butcher will also prove to be of most value to the producer.

Australia

During August a small but interesting experimental consignment of beef was received from Queensland, consisting of Hereford steers and Santa-Gertrudis cross Herefords. Seventeen head of each, of the same age and run under similar conditions of feed and management were used in this investigation. Their age at slaughter was 2½ years, and the carcases ranged from 413 lb. to 572 lb. in the case of the Herefords and 537 lb. to 638 lb. in the Santa-Gertrudis crosses. In conformation and general finish, the latter was well ahead both on a points grading and visual appraisal, a significant factor being their heavier hind quarters as compared with the Herefords, 52·3% as against 51·9%. The crosses stood up far better to the hot dry spell of weather and improved much more rapidly when conditions improved. After meeting all expenses, the Santa-Gertrudis x Herefords steers showed a return of £6 per head more than the Herefords.

The Vestey Pastoral Interests have developed new units for the road transport of cattle, which will be in operation early in the new year. They consist of a heavy duty prime mover, powered by a Rolls-Royce super-charged, six-cylinder diesel, developing 250 brake horsepower. The capacity of the truck is about 20 head and the two trailers 33 head each. The overall length of the unit is 145 feet. The units are to be used for the rapid transport of cattle from the Northern Territory into Queensland for quick finishing and marketing, to overcome the arduous droving. It is expected that the journey will take about 25 hr. as compared with the normal 5-6 weeks of droving. It will provide a much better opportunity for yearling cattle to be shipped out and may result in cattle being ready for slaughter about one year earlier than at present.

Work carried out in Australia on beef, by A. Howard and Lawrie of the C.S.I.R.O. showed that, for export in the frozen condition, blast freezing hot beef quarters at an air speed of 250 ft. per min, at −31°F. effected a considerable reduction in loss of weight during freezing; but it was associated in the cooked meat with a darker colour and significant decrease in tenderness as compared with that normally treated by chilling followed by freezing. As thought by the trade, it was proved that beef of good quality suffers proportionately less loss during freezing and storage, and through drip on subsequent thawing, than poor quality beef. In the retail meat trade, it is usually considered that the eating quality of frozen beef is improved by holding at just below the freezing point of meat before finally defrosting. It has now been proved that this process has no effect on eating quality and it does not reduce drip. It was also found that, whilst a low final acidity is associated with reduced drip in the case of small pieces of meat, it is not necessarily so in the case of larger normal butchers' cuts.

New Zealand

From October 1, 1956, to August 31, 1957, New Zealand exported over 404,000 tons of meat of which 335,708 tons were imported into the United Kingdom. In North Canterbury there have been some losses due to severe storms and flooding, but generally the exceptionally mild winter will result in a high lambing percentage for the coming season. As stocks of lamb in the United Kingdom and New Zealand are comparatively low, the new season's supplies will probably meet a very ready market. Mr. J. Clarfelt, of the British Fatstock Marketing Corporation, on a recent visit to Auckland, stated that last year his organisation imported over half-a-million New Zealand lambs and their present aim is to double that number. Two motor vessels of the Lauritzen line, specially equipped to handle refrigerated cargo, will operate a new service from New Zealand to Japan and the West Coast of North America. It could be of considerable economic benefit to the meat industry and it is said to have the full support of the New Zealand Meat Board. Meat imports by Japan will have exceeded 44 million lb. in 1957, compared with 6½ million lb. for the preceding year and New Zealand appears to be the most important potential source for supplies. The Japanese importers have recently formed a new organisation (Japan Meat Importing Deliberative Association) to co-ordinate the methods of butchering and the supply and distribution of all imported meat.

U.S.A.

Towards the end of 1957 some interest was shown in America in the possibility of obtaining from both Australia and New Zealand, increased supplies of boneless bull and cow beef, presumably for the preparation of hamburgers and similar products, at prices well in advance of those being obtained in the United Kingdom market. There could also be a demand for stout, good quality lambs, particularly when American lamb production is short, *i.e.* from December up to the end of February. In the past, one of the difficulties of developing this type of trade has been the inadequacy of shipping facilities for the transport of frozen commodities to the United States.

Considerable progress has been made by American scientists in producing an instrument capable of measuring the deposition of fat in the live animal. Its operation depends upon the transmission of ultrasonic waves emitted from a quartz crystal, passing through the fat layer and being reflected back on reaching the underlying muscle. More work is yet required, as comparisons based upon actual carcase measurement, although significant, show considerable variation. On the matter of carcase quality, meat experts in Ohio found a correlation of 0·853 between the area of the eye muscle (longissimus dorsi) and the percentage of meat in the whole carcase. It is perhaps interesting to note that, at the Smithfield Club Show, cutting sides of beef at the 12th rib has been the custom for very many years. American geneticists, calculated from testing 635 steers, from

88 different bulls, that inheritance accounted for 72% of the difference in eye muscle development.

Ultrasonics and meat tenderising

In the past considerable attention has been given to the various methods employed for producing a uniform tenderisation of meat. These have included "hanging" for long periods under controlled relatively low-temperature storage, and for shorter periods at higher temperatures, mechanical penetration of the meat tissues and the use of various enzymes. With the possible exception of mechanical penetration, it is difficult to control with any accuracy the standard of tenderness in the treated tissues. A recent development in this field is to treat the meat with ultrasonic vibration, the meat being previously frozen to retain its rigid shape and to retain the meat juices. It is claimed that the process does not result in any taste or colour changes taking place. Various methods of application have been tested, in one form the meat is placed in a brine-filled tank, the vibration being carried through the brine, or by direct plate contact on the surface of the meat and, for portions of a standard thickness, a continuous process utilising a revolving drum the samples being passed under it on a conveyor belt. The process may be practically instantaneous or take up to an hour or more, depending upon the size and composition of the product to be treated.*

Rapid cooling of meat

About ten years ago, in Germany, an experimental investigation was carried out on the rapid cooling of meat, immediately after slaughter, with the object of reducing weight loss in the stored product. This practice has now extended and is being increasingly employed in municipal slaughterhouses in Western Germany, such slaughterhouses handling over 50% of the total meat production.

As most of these abattoirs operate for a few days per week, a continuously working tunnel would be uneconomic and the chilling is usually carried out in cold rooms equipped with internal forced air circulation, operating with direct expansion, fin-type coolers. As the fans are fitted with variable speed motors, a wide range of air speeds can be employed, permitting a rapid initial cooling followed by normal chiller storage conditions. Generally no provision is made for specific relative humidity control, but the surface area of the coils ensure a relative humidity of between 90-95% during the initial cooling. Arising from recent investigations the possibility of dividing the cooling into two stages is being considered, the surface temperature of the carcase being rapidly reduced to near the freezing point of meat by high-speed air circulation at relatively low temperatures, followed by normal chilling carried out at a higher temperature and a much lower air speed. Experimental work at Karlsruhe has shown that, in the case of pork carcases, air speeds of up to 600 ft. per min. with a temperature of 28°F. do not result in the freezing of the meat. An initial air temperature of 18°F. for 1 or 2 hr. followed by 23°F. for a further 2 to 3 hr., with a subsequent temperature of 28°F. has been suggested as a suitable procedure. In the case of beef, an initial temperature of 26°F. rising to 30°F. gave the best results. If the carcases of pork and sides of beef enter the chiller within 20 min. of dressing, the chilling time for pigs is about 8-10 hr. and for sides of beef under 24 hr. Meat so treated has a good appearance and very satisfactory keeping characteristics. A somewhat similar system at the Rotterdam abattoir has resulted in a weight loss in the case of sides of beef of approximately 1% over a period of 5 days' storage.

* Reflectone Corporation, Stamford, Conn., U.S.A.

Yeasts – A New Work of Reference

THE first volume* has just been published of a series of monographs, to be called "Biologia et Industria," designed to provide a closer link between the discoveries of biological and other scientists and the industries using biological raw materials. This first volume deals with yeasts, and covers this subject in an extremely comprehensive manner. Taking as its starting point bakers' yeast, the book begins with chapters by leading international authorities on the nutritional requirements of this type of yeast and media for its culture, its cytology and cytochemistry, its physiology and biochemistry, and its industrial production.

The same general pattern is then followed in a section on brewers' yeast. Together, these two sections occupy over half the book, as is fully justified by their relative industrial importance. Shorter sections follow on wine and fruit yeasts and on *sake* and other yeasts from the Far East. A long section is then devoted to food and fodder yeasts, and the book ends with a section on yeast products, most of them of medicinal or nutritional interest.

The book brings together a large amount of knowledge of the biology of yeasts, on the one hand, and of the technologies of the industries in which yeasts are involved, on the other, and by presenting the knowledge acquired from these fields in juxtaposition it subserves an extremely useful function, and will undoubtedly prove of great value to scientists in the industries concerned.

It must be stated, however, that the book pre-supposes on the part of the reader a considerable knowledge of the biological sciences in general, and of biochemistry in particular, and its chief value would appear to be as a guide and work of reference for the research worker.

* *Yeasts.* Ed. by W. Roman. 1957. (In English.) Dr. W. Junk, The Hague. Pp. 246. 25 guilders net.

TO THE EDITOR . . .

Nisin in Food

SIR,—In the article "Nisin in Food Technology," by Dr. H. B. Hawley, published in your September, 1957, issue, the statement is made on page 432 that the use of hydrogen peroxide for preservatising cream is prevalent in Australia and that as a consequence the Commonwealth Scientific and Industrial Research Organisation (C.S.I.R.O.) has investigated the use of nisin as an alternative.

The addition of preservatives to market cream in Australia is forbidden by law and the practice is certainly not widespread here. However, the temptation to extend the shelf life of this product by adding such a well-known preservative as hydrogen peroxide is strong and there have been occasional prosecutions. The C.S.I.R.O. Dairy Research Section investigated the use of nisin to increase the commercial life of table cream as part of a general programme of work with this product. Although some earlier encouraging results were obtained the project was abandoned when it was learned that a satisfactory table cream could be marketed using heat sterilisation only.

Since Dr. Hawley's statement is misleading and could have a damaging effect on the reputation of Australian dairy products, I would ask you to give publicity to this refutation.

G. LOFTUS HILLS.

Officer-in-Charge,
Commonwealth Scientific and Industrial Research Organisation,
Dairy Research Section,
Highett,
Victoria,
Australia.

Dr. Hawley writes:

I am sorry if I have caused any embarrassment to my Australian friends in my reference to the use of hydrogen peroxide.

At the time of writing I had in mind its use in cream for the manufacture of butter. The addition of some preservative to cream which is collected at intervals of several days and subsequently made into butter is, of course, not unknown, and I do not think Australia is an exception, although I gladly accept Dr. Loftus Hill's assurance that the practice is not widespread.

What Size of Pig?

SIR,—Your editorial under the above title was pertinent and topical. This is a subject in which I am interested both as a pig producer and a member of the West Suffolk branch of the National Farmers' Union, which is one of the branches which has called for a campaign to educate the British housewife in the merits of British as opposed to Danish bacon.

My comment is that in the short time since grading was introduced, the British pig industry has made giant strides towards standardising the size and shape of the bacon pig. This problem, the experts of the Fatstock Marketing Corporation appear to believe, is rapidly nearing solution, although British breeders have advanced to conformity through Large Whites, Large Whites crossed Swedish Landrace, and even through Wessex and Sussex crossed Landrace or Large White, instead of through one national breed as in Denmark. What remains completely unstandardised is the method of cure. There are no fewer than 275 bacon factories, large or small, in the United Kingdom, and there is no assurance that each one may not use its own particular recipe for curing its products. Thus, so far as the bacon pig is concerned, the answer to Danish competition would seem to lie in the cure rather than the carcass. In other words, responsibility for action lies with the factories and not the farmers.

The question of standard versus outsized pigs does not appear to be really relevant to the issue. Admittedly a much larger tonnage of pig meat goes into the manufacturing end of the business, but in a pie, in luncheon meat or even in sausages, the consuming public are less if at all concerned whether the meat comes from a British or a Danish pig. The critical issue is one of taste, which in bacon and hams depends upon cure. A recognisable English cure, to be as palatable if not identical with the Danish, would seem to be the desideratum.

SIDNEY ROGERSON.

London, W.C.2.

Staphylococcus Aureus in Milk

A SMALL outbreak of staphylococcal food poisoning near Shrewsbury was the stimulus for the work described in a report issued by the Medical Research Council.*

Experiments were carried out to study the rate of growth of *staph. aureus* in cows' milk. Some of the experiments took place in a single laboratory but altogether four laboratories took part in the work.

In milk drawn from the udder of a cow naturally infected with staphylococci and in milk drawn from the udder of a normal cow, it was found that staphylococci grew well at temperatures of 30°C. and 37°C. but that below 25°C. growth was so slow that the chance of the milk becoming toxic within 24 hours was practicably negligible.

Staphylococcal growth was restrained in the presence of lactic and fæcal streptococci in similar or greater quantity than the staphylococci, particularly at the lower temperatures.

It was concluded from these experiments that staphylococcal food poisoning was unlikely to occur in milk unless the milk was drawn from an infected udder, was kept at a high temperature for sufficient length of time, and was not mixed with that of other cows to dilute the toxin below the active level. The milk must also be drunk raw.

* *Monthly Bull. Min. of Health and Public Health Lab. Service*, 1957, **16**, 109.

Advances in Food Technology

SEMOLINA PRODUCTS

Colour of Dough

With semolina products as well as bakery products, the colour of the dough is affected by lipoxydase. However, whilst oxidation through lipoxydase is generally a slow process of diastasic reaction, that of semolina dough is a rapid process which may take place within a few minutes. The conversion of semolina promotes the initial phase of the destruction of the pigments. Enzymatic destruction is greater with particles of smaller grain size. To some extent, the final colour of the dough can be predicted from an investigation of lipoxydase activity.—Geoffroy, *Pâtes Alimentaires, Semoules et Industries Annexes*, 1957, No. 68, 1.

GRAPEFRUIT

Browning in Tropical Storage

During investigations of factors that affect canned grapefruit sections, it was noted that there were can-to-can variations in the colour of sections that had been stored for 6-12 months either at ambient temperatures (in Florida) or at 90°F. These variations occurred even in packs processed during the same day.

A total of 151 cans from 10 packs from 2 commercial plants were examined for colour, total acidity, *p*H, ascorbic acid, and Brix value, as well as for drained weight, vacuum and headspace.

Of the 10 packs, 7 had been collected at 2-week intervals from the canners during the season and 2 had been stored in a commercial warehouse. Three experimental packs had their acid level adjusted by the addition of either citric acid or sodium hydroxide solutions.

Products were either examined after 6 months at 90°F. or after 10 or more months in a warehouse.

The only factor that was found to be significant in most instances was the total acid content. Browning occurred more frequently in products with a high acid content and with a low *p*H. Neither ascorbic acid content nor Brix value could be related to darkening to a significant degree. Poor colour resulted when, as in 2 of the packs, overpacking of the cans occurred.—R. L. Huggart, F. W. Wenzel and E. L. Moore, *Food Technol.*, 1957, **11** (12), 638.

WINE

Vitamin K_5 as a Preservative

Studies on the use of Vitamin K_5 (2-methyl-1-naphthol hydrochloride) as an alternative to sulphur dioxide as a preservative in wine have been carried out at the Oregon State College. Apple wine was used throughout the investigation. It was made with the addition of commercial dextrose to form a wine of 11-12% alcohol content. The wine was not pasteurised and no chemicals were added to it.

A wine of low alcohol content was used to study the volatile acids. This was made from apple juice which was fermented without the addition of yeast cultures and sugar.

Results showed that vitamin K_5 was more effective than sulphur dioxide in inhibiting the production of volatile acids, being more effective at 30 p.p.m. than 100 p.p.m. of sulphur dioxide.

Concentrations of vitamin K_5 of 10, 20 and 40 p.p.m. were all capable of reducing plate counts by 100%. This reduction occurred in 4 days with 10 p.p.m., in 2 days with 20 p.p.m. and in 1 day with 40 p.p.m.

On the basis of these figures, 10 p.p.m. vitamin K_5 was as effective as 200 p.p.m. SO_2 and 40 p.p.m. was as effective as 300 p.p.m. SO_2.

The vitamin-containing samples were found to have a darker and richer colour than the control and sulphur dioxide samples after both 1 and 5 months' storage periods. This was considered advantageous in apple wines, but might be considered a disadvantage in the lighter white wines.—J. N. Caspar and H. Y. Yang, *Food Technol.*, 1957, **11** (10), 536.

COFFEE

Flavour Retention in Vacuum Packs

The flavour retention of stored, vacuum-packed coffee was investigated at the Massachusetts Institute of Technology to gain a clearer understanding of the physical and chemical influences which may affect coffee flavour.

A blend was selected from several brands as being suitable for these studies. It was a Silex-ground type, vacuum-packed in 1 lb. cans, and stored at temperatures of −20°F., 36-40°F., 68°F., and 99°F. At specified intervals from 1 to 27 months samples were removed from their respective storage rooms and equilibrated for 24 hr. at 68°F. The vacuum in the cans was measured and the cans quickly sealed. The cans were then held at a temperature of 36-40°F. for analysis of the volatiles remaining in the ground coffee and for organoleptic tests.

Vacuum in the cans and volatile monocarbonyl remaining in the grounds decreased with increasing temperature of storage and length of storage but tended to reach an equilibrium after approximately one year, indicating that a relationship was established between vacuum and volatiles.

Flavour comparison between the brews prepared from the coffee samples showed no significant change with time and temperature.—M. C. Merritt, B. A. Cawley, E. E. Lockhart, B. E. Proctor and C. L. Tucker, *Food Technol.*, 1957, **11** (11), 586.

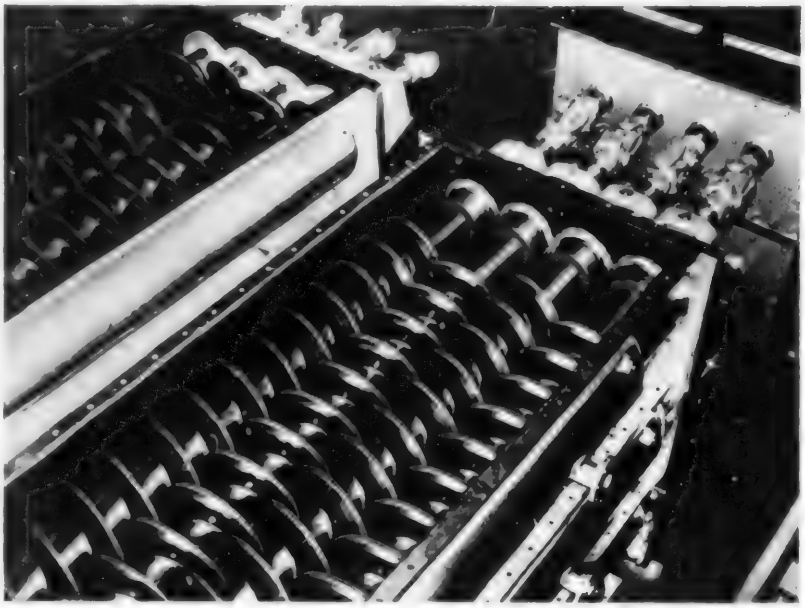
Machinery and Equipment

HELICAL SCREW HEATER

A heat processing unit designed on the principle of a screw conveyor has been introduced by Holdan Engineers (London), Ltd. Known as the *Holo-Flite*, the unit consists of a trough in which are mounted helical, hollow conveyor screws through which the heat transfer agent is circulated. The temperature and rate of flow of this heat exchange agent can be controlled, and the unit can be made in different sizes with regard to length and number of rotating flights. It is, therefore, possible to obtain units suitable for many different heat-exchange requirements.

Heat is transferred to the material being processed by contact with the surfaces of the hollow flights and shaft, and since the principle of the conveyor is employed the particles of material within the mass are subjected to continuous movement by the helices and are constantly changing position. This makes for more efficient heat-exchange, and prevents the danger of local overheating. The motion imparted to the material being processed is said to be extremely gentle, and to give little or no abrasion of the particles.

The unit can be used equally well for cooling purposes, and it is said to be finding applications in the food industry for both types of heat exchange.



The Holo-Flite processor. Hollow intermeshing syncro-screws transport and heat or cool the material being processed.

PROTECTION OF BOTTLES

Clarke-Built, Ltd., have announced that they are now sole concessionaires in Great Britain and the Continent for the Thatcher *NU-Glas* process for protecting bottles. The rate of breakage of new bottles from direct shock is quite low, but abrasions and scratches result in weakening of the bottles, which further suffer from the effects of moisture, temperature changes, and normal day to day handling. Material fatigue sets in, and the bottles eventually become liable to fracture from any slight impact.

In the *NU-Glas* process, as protective film is applied to the bottles each time they leave the washing plant. The film is composed of carbon derivatives and silica, which fill the surface-penetrating scratches and are said to restore a smooth, full tension surface to the glass, thus restoring much of the original strength of the bottles. Benefits claimed include longer bottle life, with a decrease in breakages of as much as 50%, improved appearance of the bottles, and an increase in handling speeds.

The unit involved consists primarily of two stainless steel, air-powered spray guns fitted to each side of the bottle conveyor between the washer and the filler. Each bottle automatically receives a coating of the solution, and the resulting film adheres to the bottle until it again enters the washer as a "returned empty."

HAM BOILER WASHER

A ham boiler washer, known as the *RWB/Adelmann*, is now available in this country from R. W. Bollans and Co., Ltd. It is intended to remove brine, burnt fat or other residue from ham boilers, presses, meat loaf pans and containers.

Cleaning is carried out by three brushes revolving in water, combining a forced spray with a scrubbing action. Large presses will straddle all three brushes, narrow or small presses one or two brushes.

The bowl of the washer is made from heavy cast aluminium and the brushes are of stainless steel wire and bassine. The brush spindles are refillable. The $\frac{1}{3}$ h.p. ball bearing motor is controlled by a heavy-duty switch. Reduction gears cut down the brush speeds to 800 r.p.m. and marine-type stuffing boxes prevent leakage of water from the bowl where the brush shafts enter.

LIGHTING EQUIPMENT

Two new non-corrodible lighting fittings now being marketed by the General Electric Co., Ltd., have been specially designed for use in food factories and other installations where corrosive vapours are present. The fittings, which incorporate an entirely new method of suspension, are largely of plastic construction and have no external metalwork.

The new fittings are: F.64532 which is 12½ in. high by 14 in. wide and houses a 150/200W *Osram* lamp and F.64533 which is 17 in. high and 18½ in. wide and houses a 300/500W *Osram* lamp.

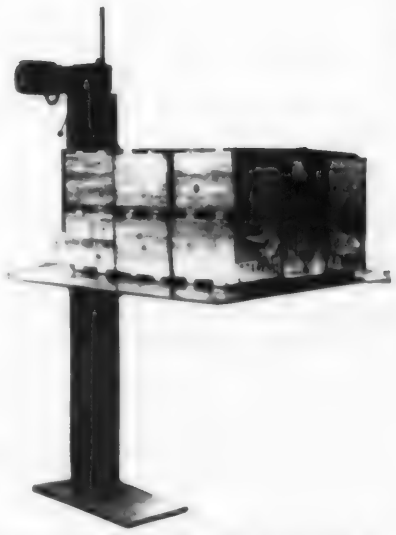
The reflector of each fitting is formed in 068 opal *Perspex* and is sealed into a front cover of clear "pinspot" *Perspex*. The combination of finishes ensures an adequate upward illumination while the maximum light output is directed downwards. The top cover is of dense opal *Perspex* which clamps tightly on to a sponge *Neoprene* gasket fixed to the main reflector body.

The suspension system ensures a satisfactory seal without the use of fixing screws by allowing the weight of the fitting to perform the clamping action. Non-corrosive materials such as *Terylene*, *Perspex*, nylon and P.V.C. are used in its construction.

LIFTING PLATFORM

A lifting platform of Swiss design is now being made under licence in this country by C. H. Johnson and Co., Ltd.

In comparison with hydraulic and orthodox lifts, these platforms are said to be competitive from both the capital cost and the installation point of view. The smaller sizes require an excavation of only 4 in. depth. Platforms are available in a range of sizes covering loads up to 15 tons, and each may be "tailor-made" to specific requirements.



The Cadet standard lifting platform, the smallest of a range made by C. H. Johnson and Co., Ltd.

NON-SLIP FLOOR SURFACE

A non-slip floor coating, known as *Safety Walk* has been introduced by the Minnesota Mining and Manufacturing Co., Ltd., who state that the material consists of extremely hard mineral grains, surface coated to a tough fabric. It is supplied in cleats, strips and rolls, and is stated to be unaffected by oil, petrol or weather and to stand up to wear for a considerable time.

The material is supplied in 3 types. The most commonly used is self adhesive and simple to apply, the second is desirable for rough surfaces such as concrete floors or where moisture or dust cannot be eliminated at the time of laying and the third is non-sparking for places where there is a risk of fire or explosion.

It may be applied to numerous surfaces, is marketed in black, green or rust, and can be painted. It may be used to prevent wear of the original surfaces, and worn cleats may be removed and replaced without disturbing surrounding areas.

MOULDED PVC FANS

The Sturtevant Engineering Co., Ltd., in conjunction with Acalor (1948), Ltd., have produced a range of moulded PVC fans based on their original *Monogram* series. These fans, designed in particular to meet the growing need for exhausting corrosive fumes, have moulded casings and a fully moulded PVC impeller, said to permit higher operating speeds and efficiencies than are obtainable with fabricated fans of this type.

No. 1 and no. 2 sizes are now available with larger sizes coming forward shortly.

Moulded PVC fan for exhaustive corrosive fumes. Both casing and impeller is made of PVC. Two sizes are available, new and larger ones are being developed.

STEEL BAND CONVEYOR

A new conveyor, designed to give increased versatility of operation, has been introduced by Sandvik Steel Conveyors, Ltd.

Known as the Sandvik *Tru-Track*, it employs standard V-rope sheaves in place of conventional pulleys, the V-rope or V-ropes being bonded to the entire length of the solid steel band of conveyor. As well as driving the conveyor the V-rope thus gives a positive tracking, reducing much of the wear and damage caused by contact with adjacent structures.

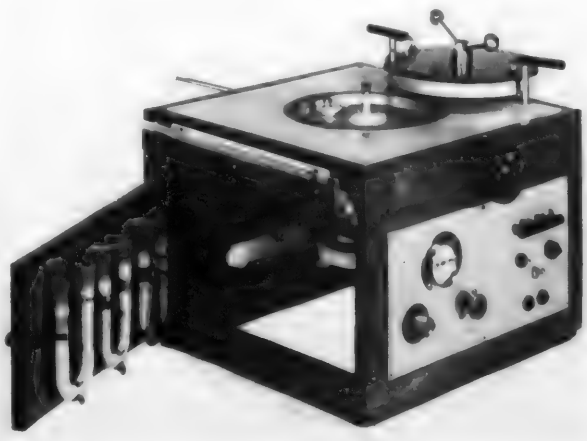
The conveyor can be operated on any incline and very close to worktables, making on-and-off handling much simpler. A water cooling arrangement may be fitted for use in the continuous processing of hot materials.

LABORATORY VACUUM OVEN

A precision vacuum oven is shortly to be produced by Griffin and George, Ltd. The oven has been developed as a result of work in the Tate and Lyle research laboratories, and was originally designed for drying sugar syrups and molasses and to provide a standard reference method for determining water in sugar products. Its use in accordance with a recommended technique is said to prevent crust formation and to eliminate some of the inaccuracies which can occur from reactions such as amino-acid/glucose condensations, and its application in many sections of the food industry is anticipated.

In the technique employed with this new *Gardiner* oven, the sample is taken into solution and distributed over an aluminium powder extender contained in a sample dish. It is then heated under vacuum, while a current of air or inert gas, dried to a water content not exceeding 0·0007 mg./l is bled over its surface. Equipment for drying this air is incorporated in the oven.

A control panel is mounted on one side of the oven, on which are fitted air and vacuum control valves, vacuum gauge, electrical control switches, fuses, mains and thermostatic indicating lights. A bimetallic thermostat, adjustable up to 110°C. ± 1°C., a thermometer, a soap film flowmeter, 0-100 ml/min., with guard, and a vacuum pump connector are also fitted to the apparatus.



The Gardiner laboratory oven, to be made shortly by Griffin and George, Ltd.

News Digest

Gelatine Research Laboratories

The new block of research laboratories belonging to Richard Hodgson and Son, Ltd., which were recently opened by the Mayor of Beverley. The first floor of the building is devoted to analytical development and research work in connection with the manufacture of all types of gelatine and glue. Consumer research and technical service departments are also located in the same floor of the building. The firm state that a large staff of technicians is employed and that room has been provided for expansion.

Mussel purification station closes

The Lytham mussel purification station on the Ribble estuary has been closed by its owners, the Lancashire County Council. The station, which was built in 1935, was handling as many as 4,200 bags of mussels in 1953, but none at all were handled in 1956. Even the 635 bags handled in the last year was not sufficient to prevent the station from being closed.

Most of the work of purifying was done by the mussels themselves, which were spread out on grids in wide, shallow tanks where they were sprayed with high pressure hoses to remove the contaminated mud. They were then covered with sea-water which has been successfully decontaminated with chlorine and dechlorinated with hypo. During the 24 hr. of the soaking the mussel pumped 10 gal. of water through its insides. The treatment was rounded off with another hosing and soaking.

Sausage campaign

The Oppenheimer Casing Co., Ltd., is now concerning itself with the controversy on sausages, and plans a campaign for better sausage eating.

The campaign will include the educating of housewives on how to cook sausages in order to retain all the succulent flavour. They say that too many housewives look upon a sausage as something to let quickly brown and toss on to a plate, but few users know that a sausage should be "blanched" before frying—that is, immersed for a few moments in near boiling water (not boiled). If this is done the sausage can be put in a frying pan (using boiling or cold fat) and it will not burst. The full flavour and succulence of the sausage will then be retained.

New equipment firm

Pulverising Machinery Division, Metals Disintegrating Company, Inc., a U.S. firm, in association with the British manufacturers of their equipment, George Adlam and Sons, Ltd., have formed a new company known as Pulverising Machinery, Ltd., to handle the marketing of the *Mikro-D* range of equipment which includes air conveyors, atomisers, dust collectors, pulverisers and rotary airlocks, etc.

The manufacturer's research and development laboratories at Bristol are being extended to give improved facilities for the solution of problems in this specialised field. Adequate stocks of spare parts are being put in hand to give a 48-hr. replacement service.

Change of address

The London office of the Pulsometer group has been moved to Pulsometer House, 20/26, Lamb's Conduit Street, W.C.1. Telephone: Holborn 1402.

Tropical Products Institute

At the same time as the name of the Colonial Products Laboratory was changed to the Tropical Products Institute, the organisation moved from the Imperial Institute building in South Kensington to new premises in Gray's Inn Road, London.

The name of the organisation anticipates its function broadening again to cover the work of assisting and advising tropical and sub-tropical countries which are not necessarily colonies, those countries which have recently acquired independence within the Commonwealth being particularly in mind.

Within the new building, which has 44,000 sq. ft. of accommodation, there are 8 self-contained laboratories devoted to advisory and investigational work on the main groups of plants and animal products of the tropics while another 6 laboratories will provide general supporting facilities. Bench space will be devoted to training overseas students and other visiting workers.

The Institute has a library containing unique information on tropical plant and animal products. There is also a small museum and a conference room.

New meat press demonstrations

Plans for country-wide showing of the new *Meta-Press* and *Clipping Machine* for moulding and casing boneless meats are announced by Viskase, Ltd. The company have just taken delivery of a new brightly coloured van for this purpose and have appointed Mr. D. Rankin as their technical representative to demonstrate this method of packing.

It is intended that Mr. Rankin will tour the British Isles giving practical demonstrations in processors' own factories.

Megator form U.S. subsidiary

A subsidiary company has been formed in the U.S.A. by Megator Pumps and Compressors, Ltd., to handle their American business in industrial and marine self-priming pumps. The new company, known as Megator Pumps and Compressors, Inc., will be responsible for marketing Megator pump sets—produced in Britain to American standards—throughout the U.S. and will provide after-sales service when required.

The headquarters of the new company are situated in Pittsburgh, Pennsylvania.

Company Profits & Prospects

"Procea" produce record profit

The profit for the year ending August 31, 1957, was twice as high as in any year since the firm was formed, reported the chairman of Procea Products, Ltd., Dr. D. W. Kent-Jones, in his annual statement. The profit for the year was £68,709 against £16,148 for the previous year and the working capital had been increased to £80,000 from £15,000 in the same period.

The demand for Procea bread as against similar bread made by competitors remained firm. The new 14 oz. loaf had proved itself to be very popular and they had no doubt that other lines, about which it was too early to speak, would also be popular.

*

Canned beer distribution

Following a small-scale introduction in 1956, Ind Coope and Allsopp, Ltd., have, during last year, established the only national canned beer distribution in England and Wales, according to the statement made by the chairman Mr. Edward Thompson, M.B.E., T.D. He went on to say that present indications provided grounds for optimism about the future of their *Long Life*, a beer brewed specially for canning.

Benskin's Watford Brewery, Ltd., had been absorbed during the year and capital had been invested in Friary Meux, Ltd. Free, Rodwell and Co., Ltd., a grain-drying and malting firm, had been acquired, and Double Diamond was now being brewed by Macardle Moore and Co., Ltd., Dundalk, Eire, in whom the firm had a substantial holding.

The Experimental Brewery at Burton had been completed.

The profits, before tax, amounted to £3,721,061 against £2,641,696. Excluding the companies acquired in the past year, the comparative profit before tax was £3,032,008, which showed an increase of 15%. The dividend was increased by 1%, making a total of 14%.

*

Fillerys boost profits

The profits made by Fillerys Toffees, Ltd., in the past year increased from £84,257 to £100,320 according to the annual statement of the chairman, Mr. Maurice L. Wells.

He went on to say, however, that it could not be expected that the firm would repeat the performance in the coming year unless it either raised its prices or its output.

During the last year the firm had reduced its current liabilities by £25,037 while its total assets had been reduced by £13,123 giving an increase in the liquid position of the firm, despite an expenditure of £34,519 on machinery, etc., in the past year.

A proposed increase in the firm's capital from £200,000 to £300,000 was approved.

Glaxo increase sales

Sales in the home market increased in all sectors including foods and animal foods and animal feed supplements according to the annual statement made by the chairman of Glaxo Laboratories, Ltd., Sir Harry Jephcott.

The net profit of the group amounted to £1,837,629 against £1,665,428 for the previous year. A final dividend of 7½%, less income tax, making a total of 12½% for the year was approved. This compares with the equivalent of 9½% on the previous year's capital.

Fenner's increase profit

Reviewing the company's activities over the past year, the chairman, Mr. C. Bradshaw and the managing director and deputy chairman, Mr. S. B. Hainsworth, together stated that the trading activities of the J. H. Fenner and Co. (Holdings), Ltd. group had been satisfactory.

The net profit of the group was £449,593 against £428,096. A dividend of 12½%, less tax, and a bonus dividend of 2½%, less tax, were recommended.

Erections and Extensions

T. Wall and Son, Ltd., are having an ice cream distribution depot built at Mowbray Drive, Blackpool, Lancs.

*

MacFarlane, Lang and Co., Ltd., have had plans drawn up for the erection of a storage depot at Lowfields Road, Leeds.

*

J. Lyons and Co., Ltd., Cadby Hall, West Kensington, London, W.14, are having a cold storage depot built at Swansea.

*

Park Cake Bakeries, Ltd., plan to build extensions to their bakery in Hathershaw Lane, Oldham, Lancs., at an estimated cost of £100,000.

*

T. Mason and Sons, Ltd., mineral water manufacturers, are planning to extend and improve their factory at Grantham Road, Smethwick, Birmingham, 41.

*

Tudor Food Products, Ltd., 3a, Sandyford Road, Newcastle-on-Tyne, are planning to build a factory on a site at the Coast Road, Wallsend-on-Tyne.

*

W. H. Smart and Co., Ltd., bacon curers, Wrentham Street, Birmingham, 5, have plans in hand to build a factory at Arthur Street, Redditch, Worcs.

*

Tate and Lyle, Ltd., are having a "granulated" house built at Thames Sugar Refinery, Silvertown, London, E.16, at an approximate cost of £250,000.

*

Mark Mayhew, Ltd., flour millers, Millocrat House, Eastcheap, London, E.C.3, have had plans prepared to erect new factory premises at Battersea Church Road, London, S.W.11.

D. S. Crawford, Ltd., have had plans approved to build an extension to their bakery at Frederick Street, Edinburgh, 2, Scotland, at an estimated expenditure of £25,000.

*

W. Pink and Sons, Ltd., Commercial Road, Portsmouth, have plans in hand for the erection of a sausage factory at 47-49, Charlotte Street, Portsmouth.

*

British Bakeries, Ltd., Columbia House, Aldwych, London, W.C.2, are planning to erect new bakeries on an area of 3½ acres at Princess Elizabeth Way Industrial Site, Cheltenham, Glos.

*

Imperial Machine Co., potato peeling machine manufacturers, Victoria Works, Edgware Road, London, N.W.2, are planning to have new factory premises built at Edgware Road, N.W.2.

*

Schenley Industries, Ltd., distillers, of America, who recently acquired the business of **Seager, Evans and Co., Ltd.**, distillers, are having plans prepared for the construction of a whisky distillery on a site between Inverness and Elgin, Scotland. Schenley Industries, Ltd., also plan to enlarge their grain whisky distillery at Strathclyde, and to extend the Glenugie Malt Whisky Factory.

*

H. J. Heinz and Co., Ltd., food manufacturers, are having plans prepared for the erection of a warehouse at Marsh Barton Trading Estate, Exeter, Devon.

*

W. J. Hubbard and Sons, Ltd., cooking and catering equipment manufacturers, are planning to build extensions to their factory at Sylvan Grove, London, S.E.15.

News for Importers

1958 sugar imports.—Arrangements for the import of raw and refined sugar during 1958 will be broadly the same as those for 1957. Imports from countries participating in the International Sugar Agreement will continue to be admitted without limitation on quantity under Open Individual Licences. Sugar from non-participating countries is subject to quota, which in 1958 will be allocated among importers according to their imports from these countries during January—November, 1957, when the trade was in practice unrestricted.

Details are given in Notice to Importers No. 842, issued by the Import Licensing Branch of the Board of Trade.

Low-grade dates exempt from duty.—Dates which have not been stoned and which are of a value less than 25s. per cwt. have been exempted from the general ad valorem duty of 10% chargeable under the Import Duties Act, 1932. These low-grade dates are not suitable for human consumption but are believed to be a valuable addition to animal feeding stuffs. The Iraq Government hope to promote their sale for this purpose in the United Kingdom.

Import quotas for 1958.—Licensing arrangements for the global import quotas for 1958 for goods still subject to the restrictions imposed in November, 1951, and March, 1952, have been announced by the Board of Trade in Notice to Importers No. 840 issued by the Import Licensing Branch.

Except in the case of apples and pears, the licensing arrangements are being converted from a 6 monthly to an annual basis. The values of these quotas have accordingly been doubled and the licences issued will be valid until December 31, 1958. The quotas for the import of apples and pears during the period to June 30, 1958, will be the same as for the first half of 1957.

The quotas will in general be allocated on the same basis as in past periods but applications for licences under the following quotas can on this occasion be considered from traders who have not previously held licences, as well as from current licence-holders. The quotas involved are Nos. 25, 28, 32a, 60 and 63.

Almonds in exported marzipan

The Import Duties (Drawback) (No. 18) Order, 1957, which provides for the payment of drawback of Customs duty on unblanched shelled almonds used in the manufacture of certain exported marzipan, came into operation on December 27, 1957, and has been published as Statutory Instruments, 1957, No. 2187.

OBITER DICTA

● It is essential that we maintain a higher degree of liquidity than usual.—*Guinness Annual Report.*

● The way to his heart . . . might lie in the tricky art of cooking his liver.—*Cookery supplement, She.*

● The only Scotch cheese—Dunlop—is in texture a little too much like its automobile counterpart for my liking.—*Frank Rowe in "600" Magazine.*

● The Duke of Edinburgh will attend the premiere of the film "Don't Go Near The Water," arranged by the Lord's Taverners.—*Manchester Guardian.*

● The $2,300,000 brewery erected by Bank Breweries, Ltd., at East Bank, Demerara, has been officially opened. Its product has been well received by the public.—*Overseas Review.*

● I don't know what kind of oranges they eat in France. I have been eating oranges at night for the past 20 years in Mexico, the United States and many countries in Europe and my health is one of the best, which I attribute precisely to eating oranges at night.—*Letter to New York Herald Tribune.*

● Mr. Majestic Owen Howard, a farmer is asking his neighbours "Please call me Owen." He said my parents decided to name me after the liner *Majestic*, sunk by the Germans the day I was born. Some country folk have asked me quite seriously if I was named after a potato—*Daily Telegraph.*

● Some strange titles have been given American beauty queens, but surely one of the strangest is that of Miss Frozen Rabbit-Meat, held by Miss Lola Mason, a New York model. Her sponsors say that she did not win the title on looks alone. She submitted the prize-winning recipe for cooking frozen rabbit.—*Daily Telegraph.*

● Rusty circled the plates and then with a glint in his eye went for the margarine! Two licks were enough. He turned to the butter and immediately his tail started to wag. In 2 min. he had wolfed about 4 oz. All of which seems to prove that dogs are more discriminating than many housewives and you can't believe certain advertisements. —*Press Release.*

FORTHCOMING EVENTS

Society of Chemical Industry

Agriculture Group

February 4. Nitrogen meeting. Speakers: Dr. G. W. Winsor, Mr. J. K. R. Gasser, Mr. A. E. M. Hood, and Dr. M. J. Head. Meeting at 10·30 a.m. Address: 14, Belgrave Square, London, S.W.1.

Food Group, Nutrition Panel

February 12. Emulsifying and dispersing agents. By Dr. C. C. Sumner and Dr. F. Aylward. Meeting at 6·15 p.m. Address: 14, Belgrave Square, London, S.W.1.

Microbiology Group

February 13. The enzymic degradation of carbohydrates. The enzymic degradation of pectin. By Dr. R. K. S. Wood and Dr. I. Cole. Cellulose breakdown in wood. By J. G. Savory. Meeting at 6.30 p.m. Address: Dept. of Botany, Imperial College, South Kensington, London, S.W.7.

Reduction in CBC fat prices

Craigmillar and British Creameries have announced that as from January 13 the prices of their three pastry margarines—*Dolphin*, *Skyhigh* and *Rize*—were reduced by 10s. 0d. per cwt. There was also a reduction of 10s. 0d. per cwt. for their *Golden Cloud* golden shortening. Other products remained the same price.

New Companies

Ashton Knitting Co., Ltd. (593107.) 8, Queen Street, London, E.C.4. Mnfrs. of and dealers in coverings for meat, etc. £20,000. Dirs.: H. C. E. Miller, A. Wood, T. P. Foster and E. F. Wilkins.

Mediterra, Ltd. (591949.) Growers, importers, exporters, canners, bottlers, processors and dealers in foodstuffs, etc. £100. Dirs.: P. B. Lockwood, Hollywell Hall, Stamford, and B. Kishon.

Robert Pirie, Ltd. (593320.) 52-54, High Holborn, London, W.C.1. Importers, brokers, factors, mnfrs., preservers, canners, packers of and dealers in meat and meat-like products, poultry, fish, etc. £100. Dirs.: R. Pirie Fraser and G. R. Fraser.

R. T. C. Food Products, Ltd. (593140.) The Bakery, Westgate, Morecambe and Heysham, Lancs. Processors of and dealers in frozen and frosted foods, etc. £10,000. Dirs.: C. J. and Mrs. A. Reed.

Sugapax, Ltd. (593356.) Mnfrs. of and dealers in sugar, syrup, molasses and allied products. £100. Subs.: P. R. Fyson, Saddlers Hall, Gutter Lane, Cheapside, London, E.C.2, and E. H. Harden.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

PEOPLE

MR. D. HEATHCOAT AMORY, first holder of the office of Minister of Agriculture, Fisheries and Food, who was promoted to be Chancellor of the Exchequer on January 7, following the resignation of Mr. Thorneycroft, sent a message to the food trades on relinquishing his Ministry. In it he thanked all in the trades for their co-operation and wished them success in the future. MR. JOHN HARE, formerly Minister for War, is the new Minister of Agriculture, etc. The post carries a salary of £5,750 p.a.

*

G. and J. Weir, Ltd., Glasgow engineers, have appointed DR. R. S. SILVER as general manager of their technical division. He was head of the company's research department from 1939 to 1946. Before returning to Weirs in 1956, he gained considerable experience in the fields of steam and combustion engineering where he held responsible appointments in design and development.

*

MR. A. J. C. HOSKYNS-ABRAHALL has become chairman of Van den Berghs, Ltd., the largest distributors of margarine and compound cooking fats in the country. He also becomes chairman of Craigmillar and British Creameries, Ltd., and vice-chairman of the parent company, Van den Berghs and Jurgens, Ltd., of which Mr. Jasper F. Knight is chairman. Mr. Hoskyns-Abrahall, who was until recently chairman of Hindustan Lever, Ltd., joined Unilever as a management trainee in 1928.

*

MR. CHARLES DOUGLAS HARE, who joined Smedley's, Ltd., as an apprentice in 1932, has been appointed a director of the firm. Aged 43, Mr. Hare has been managing Smedley's Spalding (Lincs.) factory since August 1947. With more than 25 years' service to his credit, Mr. Hare is one of Smedley's oldest employees. Under his management the firm's Spalding factory has trebled its output. The greatest change Mr. Hare has seen in the company in the last quarter century has been the development of all-the-year-round production.

*

COL. H. F. KEMBALL, T.D., D.L., who has been associated with Kemball, Bishop and Co., Ltd., since 1905, resigned his appointment as managing director at the end of 1957. He was made joint managing director of the company in 1913 and since 1948 has been sole managing director.

He has retained his seat on the board and continues as deputy chairman.

MR. R. F. KEMBALL and MR. W. W. MUIR were appointed joint managing directors as from January 1, 1958.

MR. M. COMPTON, an assistant secretary in the Ministry of Agriculture, Fisheries and Food has been appointed a member of the Food Standards Committee in place of MR. A. PROPPER, M.B.E.

Mr. A. J. C. Hoskyns-Abrahall

MR. H. W. APTHORPE retired from the position of managing director of the Cambridge Instrument Co., Ltd., at the end of 1957. He continues to be available as deputy chairman.

Mr. Apthorpe joined the company in 1900, resigning in 1907 to gain further experience. He rejoined the company in 1914 and in 1925 he was appointed a director. He has since held in succession the position of director of production, joint managing director and managing director.

Mr. H. C. PRITCHARD succeeded Mr. Apthorpe as managing director. He joined the firm from Elliott Bros.

*

MR. GEORGE E. TAYLOR, managing director of C.P. Equipment, Ltd., has been elected president of the Dairy Engineers' Association. He joined the industry in 1948 as general manager of the Creamery Package Manufacturing Co., Ltd., which was then closely associated with the C.P. Manufacturing Co., of Chicago, U.S.A. Within six months he was made managing director of the British company.

At the end of 1955, the company became entirely British owned. With the expansion of activities, which included the manufacture of the C.P.—Sellers hydraulic and rotor jet cleaner, the name of the company was changed to C.P. Equipment, Ltd., early in 1956.

MR. J. P. HALPIN has been appointed a director of Renold Chains, Ltd., by way of addition to the board.

*

MR. G. G. POOLEY has been elected chairman of the National Board for Bakery Education in succession to Mr. W. E. Haynes. He is well known for his work in the industry as well as having been president of the National Association of Master Bakers, Confectioners and Caterers.

*

MR. KENNETH WILSON, retired from the board of Albright and Wilson, Ltd., on January 22, the fiftieth anniversary of the date he joined the company. He is 72.

He became a director in 1910 and has been chairman since 1932. In appreciation of his service he has been given the honorary title of president. He will accordingly retain his long association with the company and will continue to be available for consultation. MR. S. BARRATT, who joined the company in 1932, succeeds Mr. Wilson as chairman.

Obituary

MR. H. MATTHEWS, joint managing director of Crofts (Engineers), Ltd., died suddenly on Saturday, December 28, 1957.

*

MR. CHARLES COTTRELL, one of the pioneers of margarine production, died suddenly at his home in Glasgow during December. He spent over 50 years in the margarine industry, right up to his death.

Born in Liverpool, he resided in Glasgow for the past 25 years and became manager and later director of the Cardonald Margarine Works, Ltd.

Food industry honours

Awards to several prominent persons in the food industry were included in the New Year Honours List.

MR. E. H. BALL, managing director of the British Thomson-Houston Co., Ltd., and Mr. G. A. REAY, O.B.E., superintendent of the Torry Research Station, Food Investigation Organisation, Department of Scientific and Industrial Research, have been awarded the C.B.E. MR. D. BLACK, president of the St. Edmundsbury Co-operative Bacon Factory, MR. E. CAPSTICK, director of United Dairies, Miss DOROTHY F. HOLLINGSWORTH, head of the nutrition section of the Scientific Advisers' Division (Food), Ministry of Agriculture, Fisheries and Food, and MR. R. WILLIAMS, senior soil chemist, National Agricultural Advisory Service, have been awarded the O.B.E.

Food News Overseas

Ceylon sugar factory

Kantalai Sugar Corporation will operate the sugar factory which is to be erected at Kantalai at an estimated capital cost of Rs. 21·5 million.

Fish distribution in Nyasaland

A new cold storage chamber for fish was recently opened in Blantyre by the Governor of Nyasaland. The plant, which cost £5,000, has room for 25 tons of fish and forms part of an up-to-date fish distribution system for the Southern Province.

Fishing industry in Thailand

Progress in the establishment of a joint Japanese-Thai fishing port and industry on Tarutao Island has been slow. It is reported, however, that the Council of Ministers is now considering plans for the project. These are said to include the construction of a harbour (estimated at 120 million Baht and covering an area of 240,000 metres), warehouses, an ice factory, a cannery and a factory for making fishcakes. It is estimated that the whole project will cost up to 190 million Baht, but no agreement has yet been reached as to what financial contribution Thailand will make towards the scheme.

Maple syrup

Maple syrup and maple sugar, which are the unique products of Eastern Canada and the U.S.A., are the subjects of a development of the Canadian Department of Agriculture.

The Department has introduced a method of increasing the sap yield by more than 30% through the use of aluminium spiggots or spiles. These are tap-like devices driven into the tree to draw off the sap. The use of aluminium for this purpose increases the yield because the aluminium does not react with the sap. The sap-wood is accordingly protected from oxidisation or "healing," which stops the flow of liquid.

Coconut disease research

Research costing W.I.$200,000 into the red ring disease which affects coconuts, is to be undertaken by the Government in Trinidad, according to Barclays Bank D.C.O. The disease has been increasing recently to such an extent that its effect on Trinidad's production of copra has become a matter for concern, and it is estimated that the disease could reduce the copra production by 25% within the next 10-12 years. The Government has been advised that it is unlikely that fundamental work on the disease can be completed in under three years and that field experiments will take at least another five years, but it is believed that benefits resulting from the research will more than justify the cost.

Rhodesian sugar development

The first stage of a plan to produce larger tonnages of raw sugar at Triangle Estates, near Fort Victoria in Southern Rhodesia, is reported by Barclays Bank D.C.O.

A contract valued at £325,000 for the design, supply and installation of overhead spray irrigation has been awarded to a local firm and the first phase of the plan was expected to be completed by this month. The whole plan will be in operation by April.

The area to be covered is 4,000 acres and it is expected that the estate will produce some 20,000 tons of sugar annually. It is believed that this is the largest single block overhead spray irrigation to be installed anywhere in the world.

In Northern Rhodesia a sugar refinery, costing £1,000,000 is to be built by Rhodesia Sugar Refineries. Production will begin in 1960.

Israeli canning demonstration

The 3rd annual can-cutting demonstration has recently been held by the Foodstuffs Sections of the Israeli Manufacturers' Association in co-operation with the Food Division of the Ministry of Commerce and Industry, the United States Operations Mission, and the Central Laboratory of the Citrus and Canned Products Organisation. Fourteen categories of canned goods, fruit preserves, etc., manufactured by 27 firms, were displayed as examples of quality products suitable for foreign markets. Apart from these items, the Food Technology Department of the Agricultural Experimental Station at Rehovoth, near Tel-Aviv, added a number of "experimental products" which included preserves made from the Guava fruit, a rich source of vitamin C, which is now grown in the Negev area. There were also new pomegranate and olive preserves and displays of apple produce manufactured from local varieties. All these items are still in the experimental stage. In the course of the next year, it is hoped to produce tinned sweet corn for export. Among the tinned fruit and vegetables which are already important Israeli exports, a large selection was shown, including cucumbers in vinegar and in salt, grapefruit segments, peas, melons, figs, tomato juice and tomato puree, marmalades and many kinds of jams and confitures.

Dominican sugar plans

Plans to increase sugar production in the Dominican Republic, announced by Azucarera Haina Co., include extensions at the Consuelo sugar mill costing £714,290. This will enable the Consuelo sugar refinery to double daily production next season, and will also enable the Consuelo mill to keep its workers fully employed all the year round with no slack season. The company is preparing 170,000 acres for the 1959 sugar crop.

Azucarera Haina, which operates with entirely Dominican capital, also states that its mill at Rio Haina, which has the largest production capacity in the world, will grind a record of 1½ million short tons of sugar cane in the 1957-58 season.

Greek sugar factory

The Greek Government has decided to set up a beet sugar industry, starting with a factory of 28,000 tons capacity per year. This will be followed by 2 more factories, and the 3 factories will together meet all the country's requirements. Construction of the first factory is expected to begin in the middle of 1958, in the area of Larissa or Salonica. It will employ 450 persons throughout the year.

It is estimated that the establishment of the 3 factories will save the country 12 million dollars a year.

Hungary's biggest milk tanker

The prototype of a 1,320 gallon milk tanker—biggest ever constructed in Hungary—is being built at the Ikarus Motor Works, Budapest. Work is expected to be completed by the end of the year and the tanker will be tested early in 1958. The largest tankers previously made at the works were capable of carrying 480 gallons. The tanker will have a polished aluminium container which will be filled and emptied by pipes.

Work has also been completed on a prototype bread lorry with a capacity of two tons. The bread is loaded direct from ovens on to aluminium trays which are shelved into the lorry.

Packaging

New bottle caps

Following research work carried out in America, Kraft Foods, Ltd., have introduced a new ¼-turn, twist-off cap for their tomato ketchup and tomato chutney bottles.

Consumer research revealed that 80% of American purchasers praised this new top, which is easy to open and replace. The top allows the bottles to be vapour-vacuum sealed to give increased protection to the products.

Counter display tray

Stoddart and Hansford, Ltd., are currently offering to the retail trade an attractive seven-colour transparent plastic-covered counter display tray containing one dozen freshly baked *Viota* afternoon tea cakes.

The sales message on the display ties up with full-colour advertisements appearing in leading women's weekly and monthly magazines.

Plastic bottles

Information concerning their custom-moulded and stock plastic bottles, known as *Poly-Tainers*, has been issued in booklet form by the Metal Box Co., Ltd.

Details are given of the custom-moulded bottles which can be made in a wide variety of shapes, with printed or embossed lettering, according to the customer's requirements. The various fittings which can be attached to these flexible polythene bottles to puff, pour, drop or spray are also given.

These containers are also available from stock in a number of shapes and sizes.

New counter display tray for afternoon tea cakes, introduced by Stoddart and Hansford, Ltd.

The new twist-off cap introduced by Kraft Foods, Ltd., for their tomato ketchup and tomato chutney packs.

Collapsible tubes with star-shaped orifices

In the article on Packaging (January, p. 27) we state that John Dale are offering collapsible tubes with star-shaped orifices for the decorative dispensing of icing sugars, chocolate and savoury spreads and piping jellies, etc. We wish to make it quite clear that John Dale are the manufacturers of these tubes as well as the suppliers. The reference to another company was out of context. We apologise for this slip.

Plastic display trays size 15⅛ in. × 7⅛ in. (including ¼ in. flange) and ⅞ in. deep, made by Universal Metal Products. They are made with one, two or three compartments in toughened polystyrene or P.V.C. in standard colours or in two-colour effects.

Chocolate cake pack

The latest pack placed on the market by C. Kunzle, Ltd., contains chocolate cakelets wrapped in cellulose film satchels printed in mauve and peach.

This colour scheme matches that of the display carton which is so constructed that while giving maximum display it is not weakened by the use of a cut-out lid. The body of the carton and the lid are two separate items, the lid being printed in 6 colours and the body being of plain chip board. The design shows 2 of the cakelets.

The lid is reverse-creased and inserted in the body of the carton for display purposes. The use of a slot instead of stitches in the lid allows the complete pack to be put over a metal detecting device. The whole pack is overwrapped in moisture-proof cellulose for despatch to the customer.

New synthetic foams

A new plant, built specially for making organic isocyanates, has been brought into production at the Huddersfield factory of I.C.I. Dyestuffs Division.

I.C.I.'s isocyanates are sold under the trade name *Suprasec*, and four new brands—*Suprasecs* SF, D, AC and F—have now been introduced. The *Suprasec* curing agents are supplied and used in conjunction with various polymeric reactants to produce—according to the particular isocyanate and reactant selected and the proportions and conditions employed—flexible foams, rigid foams, soft and hard rubbers, lacquers, textile coatings, electrical insulating compositions, and adhesives, and many of these compounds have important applications in the packaging field.

Suprasec SF (chemically, tolylene diisocyanate) is used in conjunction with *Daltocel* SF, a polyester compound, to produce *polyurethane* foams that can readily be cut into sheets or otherwise shaped and bonded. The foams have proved very successful in the protective packaging of commodities.

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

787,153. NAAMLOOZE VENNOOTSCHAP W. A. SCHOLTEN'S CHEMISCHE FABRIEKEN: Preparing cold swelling starch products.
787,159. BERGER EISENWERKE GES.: Method of, and apparatus for, defreezing and heating deep-frozen foods.
787,225. KONINKLIJKE INDUSTRIEELE MAATSCHAPPIJ NOURY and VAN DER LANDE N.V.: Flour or dough.
787,423: S. DE VRIES: Machine for grading fruit.

ABSTRACTS OF BRITISH PATENTS

Swing trays for bakery units

This invention concerns the use of swing trays with front and back guard lips or flanges to prevent the baking tin which the tray is holding from slipping off while the tray is travelling on a conveyor. One guard lip is carried on a framework hinged to the side of the tray. This is held in position along the front or rear of the tray, preferably by a counter weight which may be moved by projections on the bakery unit structure at the appropriate moment for the tray loading or unloading

An actuating means provided at the front of discharge station tilts the tray about the suspension pivot on its carrying conveyor to facilitate unloading of the tins.—783,428. *Baker Perkins Ltd.*

Preparing fish meal

A process is claimed in which fish meal is prepared from fish or fish waste with the addition of quicklime or slaked lime. The amount which is added is sufficient to convert the hydrophilic protein material to a hydrophilic gel, the amount being not more than 10% of the weight of the material used.

In an example of the process a batch of fish is loaded into a hopper and carried to the inlet of a mill by a conveyor belt. The material receives 5% by weight of quicklime from a container with a controllable outlet valve while it is on the conveyor. The mixture is ground down to pass through a 2-in. mesh, the resultant paste thus obtained being transferred to a drying yard, where it is spread out in thin layers and stirred once or twice to accelerate the drying. When dried it is ground to the required particle size.

Oil may be recovered from the fish by solvent extraction before the addition of the lime.

It is claimed that this method gives a light-coloured, pleasant-smelling product which is relatively cheap to produce.—784,545. *Elias Pikelin.*

Cereal composition for moist batters and doughs

A reconstituted replacement for cereal flours in moist batters and doughs which will withstand starch liquefaction during storage periods contains essentially only an intimate admixture of dry, powdered wheat starch particles, free of diastatic enzymes, small and broken starch cells and mould spores, and a smaller proportion of dry, powdered undenatured gum gluten also free of diastatic enzymes and mould spores.

The prepared dough composition adapted to withstand starch liquefaction when maintained at a temperature of between 35° and 50°F. contains an admixture as before together with a relatively small amount of dried protein food products, a leavening ingredient and water equal to the volume of the ingredients in their dry state.

Natural cereal flours are "washed out" to separate the starch and gluten, which is then mixed while excluding the introduction of bacteria and mould from the surrounding air. The water and other ingredients are added to make a composition which will withstand thinning and lessening of viscosity through liquefaction of starch during storage.—782,222. *Pillsbury Mills, Inc.*

Technical Press Review
February

World Crops.—Pest Control: Progress in Locust Research; Blood Tests for Users of Organo-Phosphorus Insectides; Crop Pests Make History.

Dairy Engineering.—Reclamation of Bottle Washing Detergents; Dairy Maintenance; Cleaning in the Dairy: Bacteriological Control; Engineering Aspects; Dairy Cleaning Equipment and Services Survey; New Life for Old Bottles.

Manufacturing Chemist.—Packaging and Packaging Machinery; Germicidal Ampholytic Surface Agents; The Behaviour of a Commercial Anti-Odorant in Respect of Four Odorous Irritants; Thiazoles and Analogues; Progress Reports: Disinfectants and Disinfection; Hormones; Cosmetics and Toilet Preparations.

Chemical and Process Engineering.—Fresh Water from Sea Water; New Trends in Absorber and Fractionator Tray Design; Silicate Chemicals for Industry; New Aluminium Plant for Canada.

Paint Manufacture.—How the Paint Industry Handles Materials; Influence of Organic Titanates on the Properties of Paints; Styrenated Epoxy Esters.

Atomics.—The Blind River Uranium Field of Canada—2; Electromagnetic Pumping of Liquid Metals; Review of Pumps and Fans: Pumping Liquid Metals; Some Unusual Pumps; Fans and Blowers; Process Pumps; Gas Compressors.

Automation Progress.—Continuous Manufacture of Roller Bearings; Russian Work on Translation by Computer; Pointers to Automation in the U.S.S.R.; Numerically Controlled Flame Cutting; Nucleonic Gauge Controls Brass Rolling; Automatic Control of Electro-Plating; Pneumatic Handling in Industry.

Trade Marks

QUAKER.—759,161. Non-medicated confectionery. **Quaker Oats, Ltd.,** Bridge Road, Southall, Middlesex.

HAMMER LANDBROT. — B761,924. Bread. **Hammerlandbrotwerke, G.m.b.H.,** Vienna 11, Obere, Donaustrasse 15a, Austria.

JOHN W. WELCH.—762,754. Non-medicated confectionery. **John W. Welch, Ltd.,** The Toffery, Laburnum Avenue, Whitley Bay.

BROPAC.—763,007 Substances used in the making of bread and other farinaceous baked foodstuffs for improving their quality and keeping properties. **Badex, Ltd.,** Waverley House, Hale Road, Altrincham, Ches.

TOBLER CAPPUCCHINO. — 763,336. Chocolate, chocolates and non-medicated confectionery. **Chocolat Tobler, Ltd.,** 20, Soho Square, London, W.1.

CARA SNAX.—763,434. Wafer biscuits. **Askeys Premier Biscuit Co., Ltd.,** 290, Kensal Road, London, W.10.

CARAMBAR. — 764,028. Chocolate, chocolate couverture, chocolates and non-medicated confectionery. **Nestlé Co., Ltd.,** Hayes, Middlesex.

ANANETTE. — 764,921. Chocolate, chocolates and non-medicated confectionery. **Chocolat Tobler, Ltd.,** 20, Soho Square, London, W.1.

DYNAFAC.—764,911. Foodstuffs for animals. **Armour and Co.,** Union Stock Yards, Chicago, 9, U.S.A.

KENTAROM.—764,692. Non-alcoholic beverages and preparations for making same. **Schimmel Boehm, Ltd.,** 19, Bentinck Street, London, W.1.

CLAROPAKS.—764,856. Bacon, ham, cooked meats, meat products (for food) and cheese, all being pre-packed. **A. and L. Jessett and F. M. Henry,** trading as **Jessett and Henry,** 16, Hamilton Road, West Norwood, London, S.E.27.

GALADINE.—762,402. Milk; and milk products, all for food. **Cooperatieve Vereeniging Tot Bereiding Van Melkproducten, Kortheidshalve Cooperatieve Condensfabriek "Friesland,"** Kanaalweg 228-230, Leeuwarden, Holland.

DELISHFUL.—764,586. Sugar confectionery and chocolate confectionery, none being medicated. **Hall Bros. (Whitefield), Ltd.,** The "State" Confectionery Works, Stanley Street, Whitefield, nr. Manchester.

SNOCREME.—B764,596. Ice cream confections. **T. Wall and Sons, Ltd.,** "The Friary," Friar's Place Lane, Acton, London, W.3.

VIOTA INSTANT ICING.—763,837. Icing for cakes. **Stoddart and Hansford, Ltd.,** 7, Islington Green, London, N.1.

"GEEST."—B756,282. Bananas, apples, pears, melons, grapes, tomatoes, oranges, grapefruit, peaches, lemons, pineapples, gooseberries, onions, cucumbers, lettuce, cabbages, beans, cauliflowers, potatoes, radish and leeks, all being fresh; coconuts. **Geest Industries, Ltd.,** White House Chambers, Spalding, Lincs.

SUNBAR.—765,471. Non-alcoholic beverages. **A. G. Barr and Co., Ltd.,** 1306, Gallowgate, Glasgow, E.1.

New patents are from the Journal of Patents and new trade marks are from the Trade Marks Journal. In each case permission to publish has been given by the Controller of Her Majesty's Stationery Office. Each of the publications is obtainable from the Patents Office, 25, Southampton Buildings, London, W.C.2.

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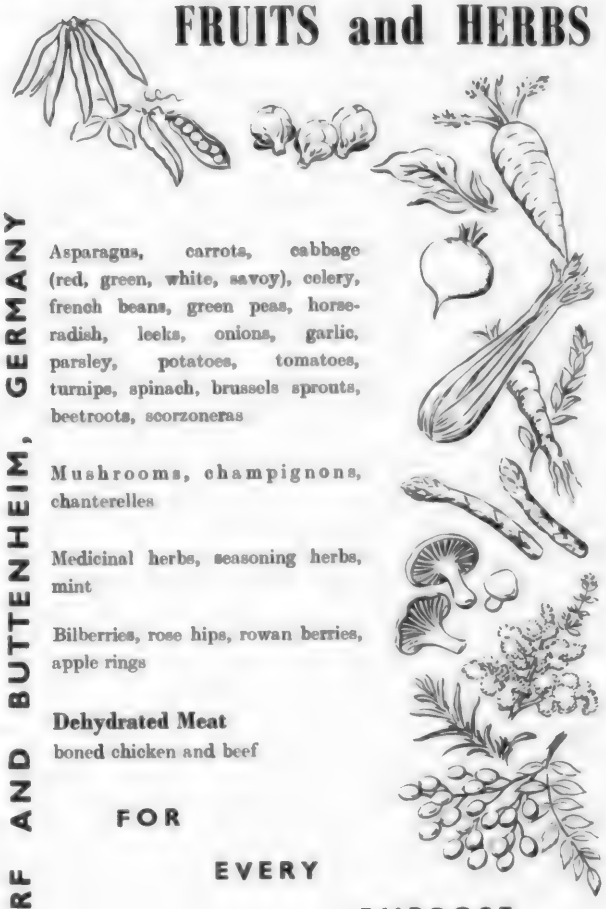

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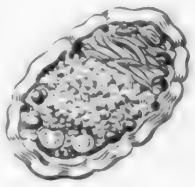

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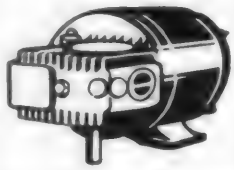

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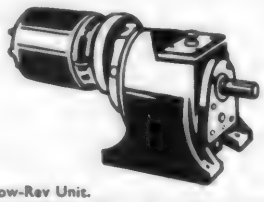
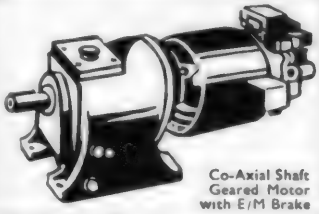


Slow-Rev Unit.



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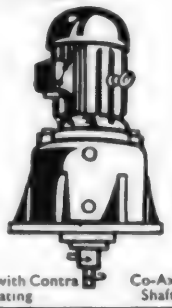

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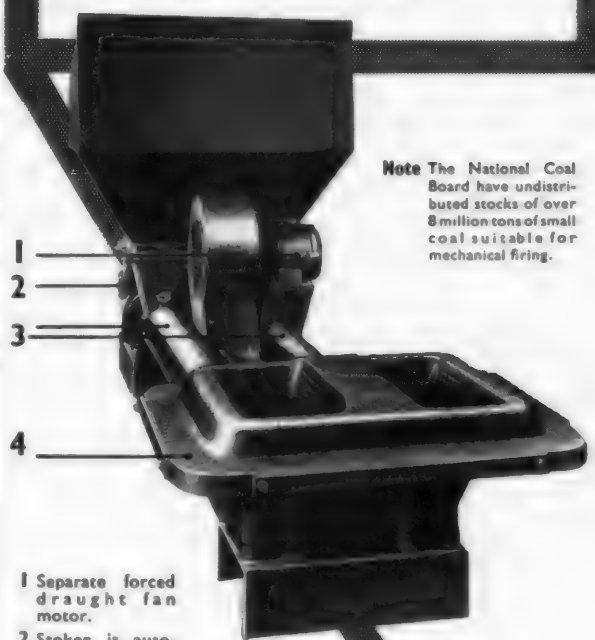

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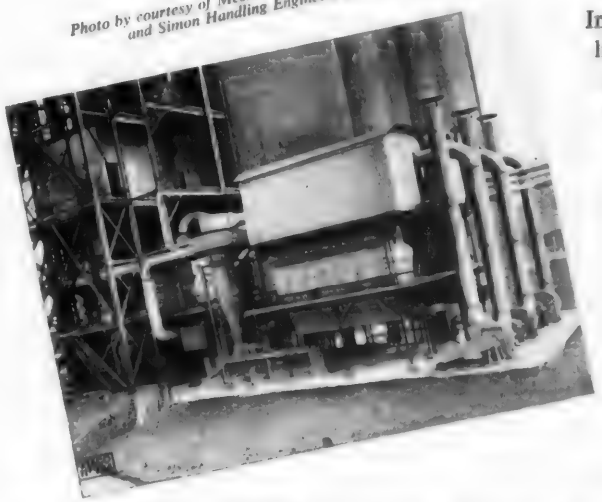

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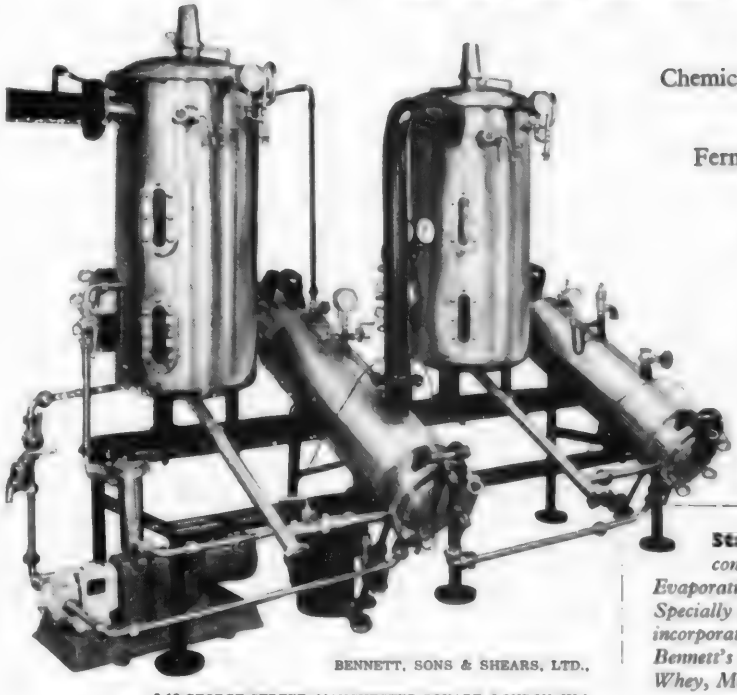

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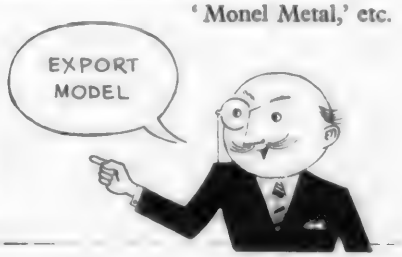

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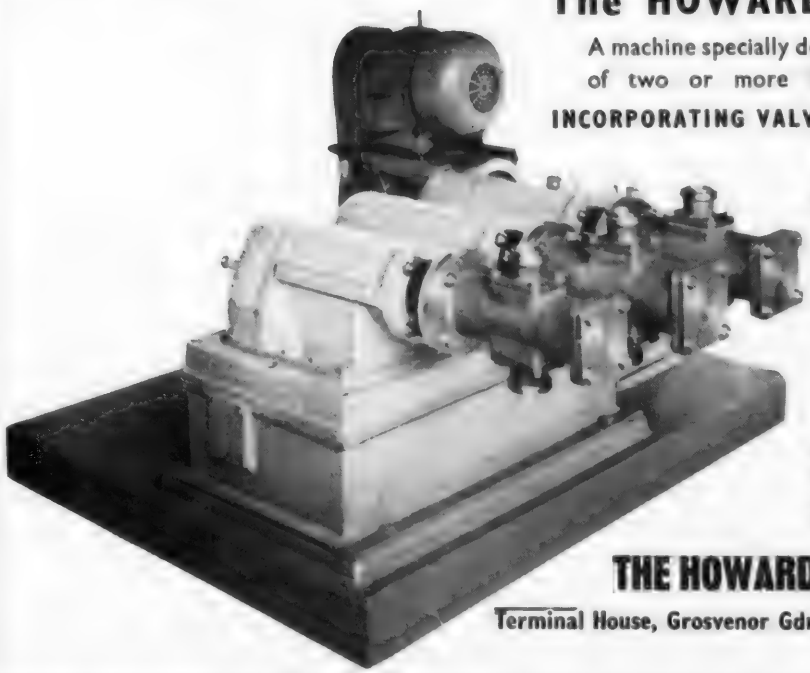

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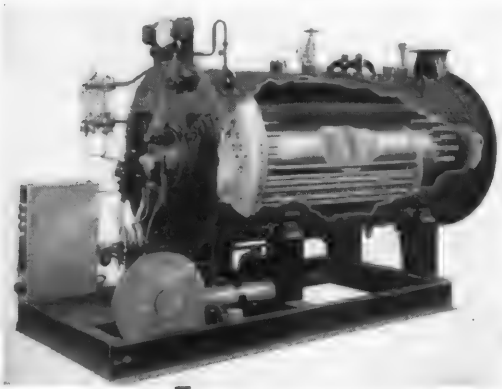

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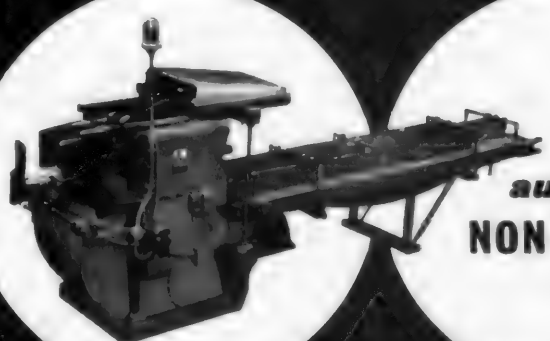

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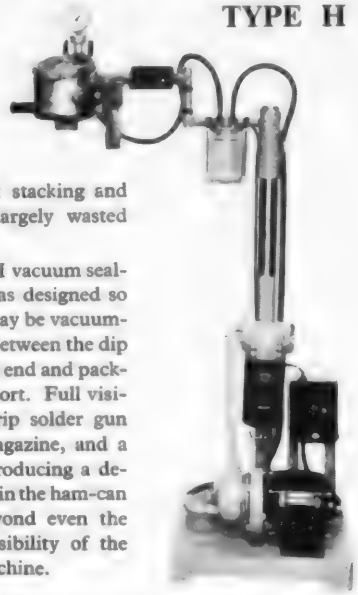

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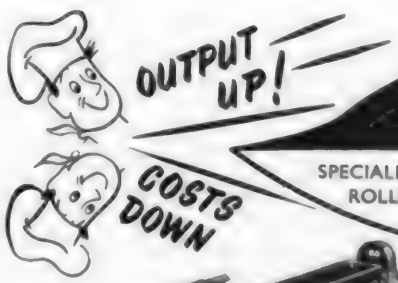

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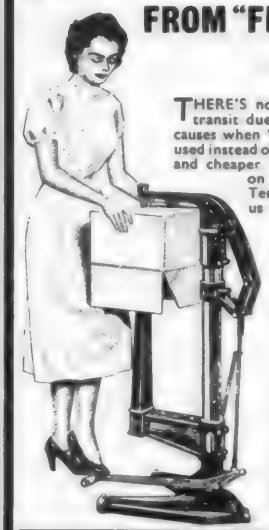

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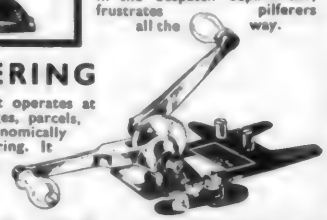

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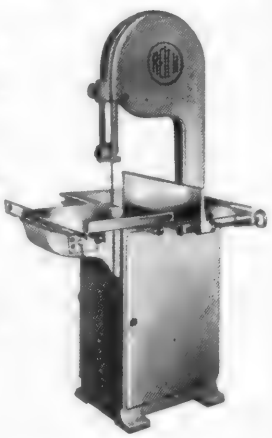

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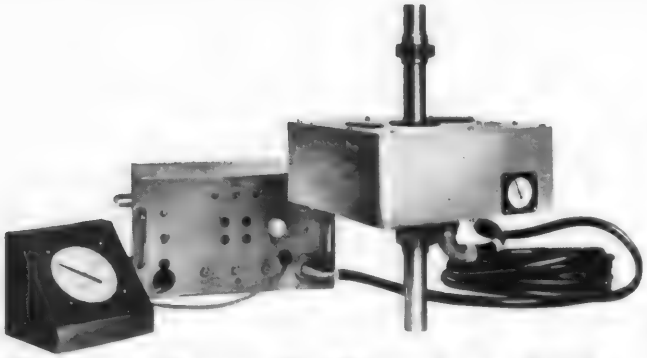

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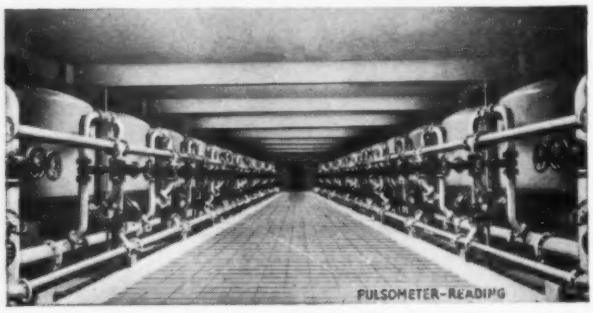

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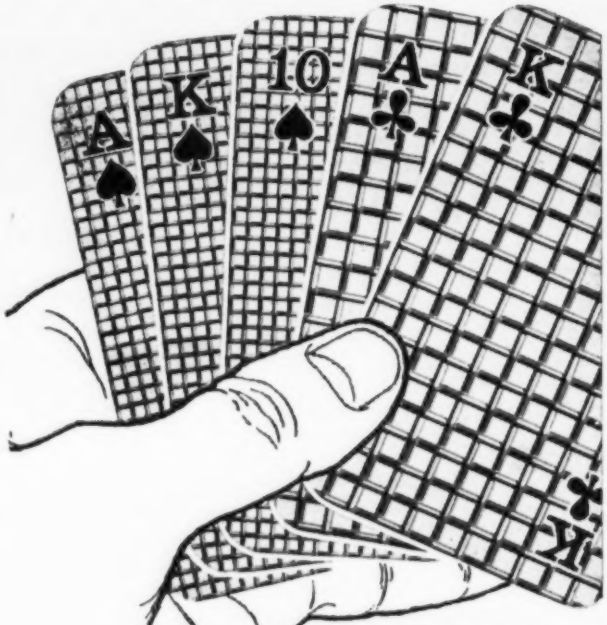

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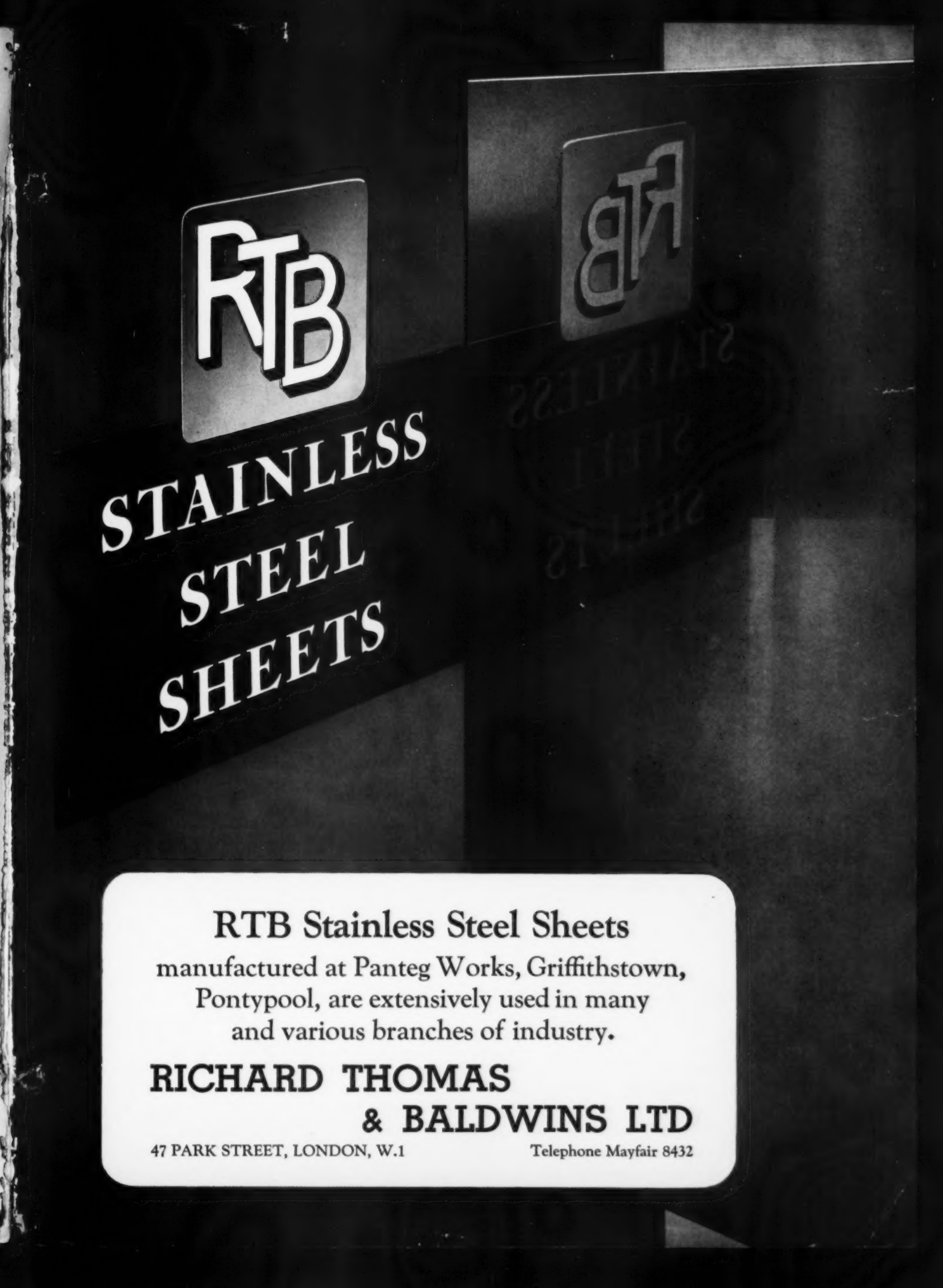

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